Public Input No. 124-NFPA 54-2024 [Global Input]

See attached issued TIA for changes to various paragraphs throughout.

Additional Proposed Changes

File Name	Description	Approved
TIA_54_24_1_1726.pdf	54_24_1_1726	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 24-1 (Log 1726) issued by the Standards Council on August 25, 2023 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document. Substantiation: The NFPA 54 Committee approved SR-31 which reorganized many sections throughout NFPA 54 (the SR-31 was 81 pages long). The reorganization broke up any existing section that had multiple requirements so that each requirement had its own subsection. Sometimes this required editorial changes to make it flow correctly. If upheld, the changes made in SR-31 will result in an NFPA 54 version of the National Fuel Gas Code (NFGC) that is substantially different from the ANSI Z223.1 version of the NFGC which is developed by AGA. This second issue is problematic because many external documents and organizations are currently able to reference almost any part of the NFGC without specifying NFPA or ANSI because the sections match. With the extensive renumbering of the NFPA 54 sections many of those references would be incorrect, which could hamper enforcement. The TIA simply reverts the organization back to what it was in the first draft of the NFPA 54, 2024 edition. Emergency Nature: The standard contains an error or an omission that was overlooked during the regular revision process. The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification for the action. SR-31 was discussed at the October meeting of the Z223 and NFPA 54 committees. During that discussion some concerns were raised that the sweeping changes may have led to errors and omissions. During the ballot, many members found technical issues with some of the reorganized sections (including two of the members who voted Affirmative w/ Comment). There was even a clarification ballot to fix an error contained in this SR. Members noted that they didn't have time to review such a long SR and would like to have a second, more detailed review to fix other issues.

Submitter Information Verification

Submitter Full Name: NFPA TIA

Organization: Technical Committee on National Fuel Gas Code

Street Address:

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Submittal Date: Thu Jun 06 18:47:31 EDT 2024

Committee: NFG-AAA

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Public Input No. 25-NFPA 54-2024 [Global Input]

Substitute “gas supplier” for “serving gas supplier”

Statement of Problem and Substantiation for Public Input

It is proposed to use the term “gas supplier” instead of “serving gas supplier” as both mean the same thing, and it is clear to users that the term means the natural gas or propane company suppling fuel gas to a consumer. The term is used 7 times in the Code

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Committee: NFG-AAA

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Public Input No. 27-NFPA 54-2024 [Global Input]

Revise Tables 6.2.1 (a), 6.2.1 (b) and 6.2.1 (h) by adding an Intended Use line below the gas material box and above the line "Pipe Size (in.) to read:

Intended Use: Inlet gas pressure is 7in. w.c. or lower.

Statement of Problem and Substantiation for Public Input

There are 24 sizing tables for natural gas in the Code. It is not unusual for the wrong table to be used because the descriptions are similar. The proposed Intended Use line will make it more evident that the tables with a 0.3 psi drop are intended for systems with the minimum inlet pressure and will help to prevent under-sizing of pipe. With the present Code, and installer can see that both Tables 6.2.1 (1) and (b) appear to be applicable, and might note that Table 6.2.1 (b) provided greater capacity, allowing the use of smaller pipe.

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Committee: NFG-AAA

Public Input No. 28-NFPA 54-2024 [Global Input]

Delete Table 6.2.1 (f).

Statement of Problem and Substantiation for Public Input

The table is deleted as the use of 3 psl inlet pressure systems is not common. The the knowledge of the submitted, gas utilities do not normally offer 3 psi pressure for building use. The deletion of the table does not intend to prohibit 3 psi piping systems, but will require the engineer or designer to identify the proper sizing table. The table will always be available in previous editions of the Code. Reducing the number of tables by deleting those that will rarely be used reduces the possibliity of the wrong table being used, resulting in undersized pipe.

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Submittal Date: Mon May 20 10:03:24 EDT 2024

Committee: NFG-AAA

Public Input No. 31-NFPA 54-2024 [Global Input]

Delete Table 6.2.1 (k).

Statement of Problem and Substantiation for Public Input

The table is no longer needed. The combination of a less than 2 psi (<55 in. w.c.) system inlet pressure and 17 in. with a pressure drop of 17 in w.c. is unlikely today.

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Committee: NFG-AAA

Public Input No. 32-NFPA 54-2024 [Global Input]

Delete Table 6.2.1 (m).

Statement of Problem and Substantiation for Public Input

The table is of little utility. It is limited to a total load of 150 Cu. Ft. per hour, yet the table has entries up to 2,270 Cu. Ft per hour. Only the length rows up to 60 ft. provide capacities under 150 Cu. Ft. per hour. This table covers the inlet to a line pressure regulator. The information is being provided by manufacturers of line pressure regulators, therefore this table is not needed.

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Committee: NFG-AAA

Public Input No. 35-NFPA 54-2024 [Global Input]

1. Revise the Intended Use in Table 6.2.1 (q) to read:

INTENDED USE: Supply pressuer between 11 in. w.c. and 14 in. w.c. with or without a line pressure regulator

2. Revise the notes to Table 6.2.1 (q) to read:

Notes:(1) Tables include losses for four 90 degree bends and two end fittings. Tubing runs with larger numbers of bends and/or fittings ~~shall~~ should be incresaed by an equivalent length of tubing to the following equation: *L*=1.3*n*, where *L* is additional length (ft) of tubing an *n* is the number of additional fittings and/or bends.

(2) No not use unless the gas supplier can supply 11 in. w.c. or greater.

(3) This table is intended for use with engineered methods.

(4) All table entries are rounded to 3 significant ditits.

Statement of Problem and Substantiation for Public Input

1. The Intended Use is revise to be consistent with allowable practice. 2. Note (1) is revised to use "should" instead of "shall" as requirements cannot be in table notes. A new Note (2) is added to remind the user that a minimum supply pressure of 11" w.c. is needed to use this table. This reiterates the Intended Use line, as the table has been misused. A new Note 3 is added as the table is intended for use where higher pressures or a line pressure regulator is used. Either of these conditions will require and engineered method.

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Committee: NFG-AAA

Public Input No. 40-NFPA 54-2024 [Global Input]

Revise Table 6.21 j) to read:

INTENDED USE: Tube Sizing Between Line Pressure Regulator and the Appliance.

Statement of Problem and Substantiation for Public Input

The term "line pressure regulator" is substituted for "house pressure regulator". Line pressure regulator is a defined term, and its use is preferred.

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Submittal Date: Mon May 20 15:35:54 EDT 2024

Committee: NFG-AAA

Public Input No. 41-NFPA 54-2024 [Global Input]

Revise Table 6.2.1 (p) as follows:

1. Revise the Intended Use to read:

Intended Use: Supply pressure between 8 in. w.c.and 14 in. w.c. with or without a line pressure regulator.

2. Revise the Table Notes to read:

Notes:

(1) Table includes losses for four 90 degree bends and two end fittings. Tubing runs with larger numbers of bends and/or fittings shoiuld be increased by an equivalent length of tubing to the following equation: $L = 1.3n$, where L is additional length (ft) of tubing and n is the number of additional fittings and/or bends.

(2)This Table is intended for use with engineered methods

(3) All table entries are rounded to 3 significant digits.

Statement of Problem and Substantiation for Public Input

The Intended Use is revised to be consistent with allowable practice. Note (1) is revised to substitute "should" for "shall" as mandatory requirements cannot be used in Table Notes. A new note (2) is added to remind users that in inlet pressure between 11 in. w.c. and 14 in. w.c. is needed to use the Table.

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Committee: NFG-AAA

Public Input No. 42-NFPA 54-2024 [Global Input]

Delete Tables 6.3.1 (a) and 6.3.1 (b).

Statement of Problem and Substantiation for Public Input

These tables cover propane lines with inlet pressure of 10 psig. The Code covers pressure from the outlet of the final stage pressure regulator (1.1.1.1 (A)), therefore these cover piping outside the scope of the Code. Similar tables are included in NFPA 58.

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Public Input No. 83-NFPA 54-2024 [Global Input]

Revise the title of paragraphs 10.2.1, 10.3.1, 10.4.1, 10.6.1, 10.7.1, 10.8.1, 10.12.1, 10.13.1, 10.16.1, 10.17.1, 10.19.1, 10.20.1, 10.21.1, 10.24.1, 10.25.1 and 10.26.1 to read:

~~Application~~ Listing.

Statement of Problem and Substantiation for Public Input

These paragraphs establish listing requirements, not the application of the appliance.

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Committee: NFG-AAA

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Public Input No. 14-NFPA 54-2024 [Section No. 1.1.1.1(A)]

(A)*

Coverage of piping systems shall extend from the point of delivery to the appliance ~~connections~~isolation valve. For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted LP-Gas systems, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators where no meter is installed. Where a meter is installed, the point of delivery shall be the outlet of the meter.

Statement of Problem and Substantiation for Public Input

Appliance connection is not consistent with equipment codes like NFPA 85 or 86. In these documents coverage is known to begin with the "equipment isolation valve". Harmonizing these terms would avoid confusion for users.

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Submittal Date: Sun May 12 16:31:02 EDT 2024

Committee: NFG-AAA

Public Input No. 15-NFPA 54-2024 [Section No. 1.1.1.1(D)]

(D)

~~This code~~ Chapter 7, sections 7.10 and 7.11 of this code shall apply to gas–air mixture systems operating within the flammable range at a pressure of 10 psi (69 kPa) or less.

Statement of Problem and Substantiation for Public Input

It is not correct to imply that the entire document applies to gas-air mixtures. Many sections of many chapters clearly do not. For example, the pipe sizing tables do not apply to gas-air mixtures. The document user deserves to be forewarned that only a narrow portion of the document applies to this special condition.

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Committee: NFG-AAA

Public Input No. 17-NFPA 54-2024 [Section No. 1.1.1.1(F)]

(F)

Requirements for appliances, equipment, and related accessories shall include installation, combustion air, ventilation air, draft testing, and venting.

Statement of Problem and Substantiation for Public Input

Draft testing is a significant requirement covered in detail within this document. It should be mentioned in the overall scope statement here.

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Committee: NFG-AAA

Public Input No. 19-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) ~~Fuel gas piping in electric utility power plants~~

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

If the power plant operates with natural gas at 125 psig or less there is no technical reason why this standard should not apply. Electrical generating plants have gas piping, regulators, and valves that can pose a hazard if they are not selected and or installed or tested as per this code, just like for any other gas-fired pieces of equipment.

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Submittal Date: Tue May 14 10:43:03 EDT 2024

Committee: NFG-AAA

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Public Input No. 33-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) ~~Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes~~

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

The document currently says, "Installation of" and then lists appliances that might be used in farming. This is confusing. NFPA 54 is not an equipment code. Hence, nothing past the fuel train equipment isolation valve is covered anyway. I would argue that the gas piping to this equipment is covered since that does not involve installation of this equipment. The issues then are then mostly combustion air, flues and draft. It does not make sense to not make this equipment safe for use for farmers. Farmers lives should be valued as much as anyone else's life. It's also true that manual of style issues do not want lists of things. I would also argue that is this list comprehensive or not? I do not believe this exception has a technical reason for being here.

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Submittal Date: Mon May 20 13:22:07 EDT 2024

Committee: NFG-AAA

Public Input No. 34-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) ~~Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen~~

(5)

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

This statement is redundant and again is a list. Unless we list every gas known to mankind users are supposed to think by default that the gas they are considering must be part of the

code. I contend that we already say in item B that the document is about natural gas alone. That is sufficient.

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Submittal Date: Mon May 20 13:30:31 EDT 2024
Committee: NFG-AAA

Public Input No. 36-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) ~~Construction of appliances~~

(20)

Statement of Problem and Substantiation for Public Input

It's already clear that NFPA 54 is not an equipment code. The document already clearly states that its scope only covers to the appliance connection. Keeping this in the document, "construction of appliances" is confusing.

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Submittal Date: Mon May 20 13:45:44 EDT 2024

Committee: NFG-AAA

Public Input No. 37-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) ~~Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters~~

(11)

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

First of all, this again is not an equipment code so we should never be suggesting that it is. Secondly, this is completely not enforceable. Isn't everything proprietary? The terms used here are so general and broad they could mean anything. Again, this is a list and unless our lists contain everything they make no sense.

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Submittal Date: Mon May 20 13:49:33 EDT 2024

Committee: NFG-AAA

Public Input No. 38-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) ~~Building design and construction, except as specified herein~~

(17)

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

We cover everything that there is for the use of natural gas within building systems. To say that there is an exemption for "building construction" makes no sense and is confusing and useless. It only can tend to steer people away from the document and provide potential claims for why something was not done according to the document. It does not support the overall cause of gas and gas piping safety.

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Submittal Date: Mon May 20 13:54:21 EDT 2024

Committee: NFG-AAA

Public Input No. 39-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) ~~Fuel gas systems using hydrogen as a fuel~~

(19)

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

The document already in B explains that its just for natural gas. It makes no sense to be telling people that it also does not apply to hydrogen. If we need to explain on a singular basis all of the gases that are not considered to be part of the document we would need another couple of pages. If the alternate fuels TG wants to insert something here regarding hydrogen thats fine but for now, this exclusion does not belong.

Submitter Information Verification

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Submittal Date: Mon May 20 13:57:24 EDT 2024

Committee: NFG-AAA

Public Input No. 43-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) ~~Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions~~

(7)

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

It is usual and customary to expect that large chemical plants are designed according to other piping codes and standards which may be as rigorous as NFPA 54. If that's the case then safety of the systems and topics covered within NFPA 54 can be covered. However, the way this is currently worded is not enforceable. What are the criteria for a large, medium and small chemical plant? What does integrated mean in the context of a chemical plant? Do we need to tell people that this does not include fuel gases made from different derivations of things within the plant, this is the same as telling them again that this only covers natural gas which again is pointed out in B. There is no technical basis to have this statement, it is not enforceable, and part of it is already stated within item B.

Submitter Information Verification

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Submittal Date: Mon May 20 17:34:20 EDT 2024

Committee: NFG-AAA

By checking this box I affirm that I am John Puskar, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature

Public Input No. 44-NFPA 54-2024 [Section No. 1.1.1.2]

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) ~~Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants~~

(6)

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

There is no technical basis for excluding these facilities. These facilities do not constitute some type of obviously inherently safe entity that needs no protection from NFPA 54. The entities named might as well be car washes, circus tents, and bowling balls. Petroleum refineries often have natural gas feeds to auxiliary boilers that are less than 125 psig. This would be a parallel configuration to others used in industry, a gas compressor station may have natural gas engine driven compressors, I am not aware of much gas use in pumping stations, or loading terminals? What exactly is a compounding plant anyway? Why in the world would tank farms be here? There are sometimes direct fired asphalt tank heaters but other than that I do not see why this is even mentioned? Natural gas processing plants should be covered to the extent they use natural gas as specified in this document. Not derivatives of naturals gas, but the finished product when it is within the parameters that apply to this document. Again, NO technical basis for these exclusions.

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Submittal Date: Mon May 20 17:48:00 EDT 2024

Committee: NFG-AAA

1.1.1.2

This code shall not apply to the following items:

(1) Portable LP-Gas appliances and equipment of all types that are not connected to a fixed fuel piping system

(2) Installation of appliances such as brooders, dehydrators, dryers, and irrigation equipment used for agricultural purposes

(3) Raw material (feedstock) applications except for piping to special atmosphere generators

(4) Oxygen–fuel gas cutting and welding systems

(5) Industrial gas applications using such gases as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen

(6) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants

(7) Large integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions

(8) LP-Gas installations at utility gas plants

(9) *Liquefied natural gas (LNG) systems from the liquefication system isolation valve through the liquefication process and storage system but not including vaporization equipment and produced vaporized gas.

(10) Fuel gas piping in electric utility power plants

(11) Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters

(12) LP-Gas equipment for vaporization, gas mixing, and gas manufacturing

(13) LP-Gas piping for buildings under construction or renovations that is not to become part of the permanent building piping system — that is, temporary fixed piping for building heat

(14) Installation of LP-Gas systems for railroad switch heating

(15) Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles

(16) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution of gas, other than undiluted LP-Gas

(17) Building design and construction, except as specified herein

(18) Fuel gas systems on recreational vehicles manufactured in accordance with NFPA 1192

(19) Fuel gas systems using hydrogen as a fuel

(20) Construction of appliances

Statement of Problem and Substantiation for Public Input

Gas piping to the liquefication part of the facility is no different than any other gas piping that NFPA 54 covers. Likewise, the vaporization facilities, if they are fired are typically hydronic boilers just like a commercial building, or some type of submerged combustion burner, or another type of process heater heating a glycol bath. The gas feeds to these burners are nothing different than systems that NFPA 54 covers in other applications. Likewise, when LNG gas is vaporized and inserted into a distribution system it is then the same gas under the same conditions that NFPA 54 covers anyway. Why would we create such a broad blanket exemption for such conventional uses of gas that are similar to other NFPA 54 uses of gas.

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Submittal Date: Mon May 20 17:57:55 EDT 2024

Committee: NFG-AAA

Public Input No. 86-NFPA 54-2024 [Section No. 1.2]

1.2 Purpose. ~~(Reserved)~~ The purpose of this code shall be to provide for safe installations of fuel gas piping systems, appliances, equipment, and related accessories,

Statement of Problem and Substantiation for Public Input

A purpose statement is added to reflect the purpose of the Code. Currently, no purpose is included and it is believed that one will assist users in understanding the intent of the Code.

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Submittal Date: Thu May 30 22:52:09 EDT 2024
Committee: NFG-AAA

Public Input No. 87-NFPA 54-2024 [Section No. 2.3.5]

2.3.5 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. ~~www.ul.com~~

UL 103, *Factory-Built Chimneys for Residential Type and Building Heating Appliances*, 2010, revised 2021.

UL 353, *Limit Controls*, 1994, revised 2011.

UL 378, *Draft Equipment*, 2006, revised 2013.

UL 441, *Gas Vents*, ~~2019~~2024.

UL 467, *Grounding and Bonding Equipment*, 2022.

UL 641, *Type L Low-Temperature Venting Systems*, 2010, revised 2018.

UL 651, *Schedule 40 and 80 Type EB and A Rigid PVC Conduit and Fittings,* 2011, revised 2022.

UL 959, *Medium Heat Appliance Factory-Built Chimneys*, 2010, revised ~~2019~~2024.

UL 1738, *Venting Systems for Gas Burning Appliances, Categories II, III and IV*, ~~2010, revised 2021~~2023.

UL 1777, *Chimney Liners*, 2015, revised ~~2019~~2024.

UL 2158A, *Clothes Dryer Transition Ducts*, 2013, revised ~~2021~~2023.

UL 2561, *1400 Degree Fahrenheit Factory-Built Chimneys*, 2016, revised ~~2018~~2022.

UL 2989, *Outline of Investigation for Tracer Wire*, ~~2017~~2022.

UL 60730-2-6, *Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Automatic Electrical Pressure Sensing Controls Including Mechanical Requirements*, 2016, revised 2021.

Statement of Problem and Substantiation for Public Input

Update references to most current editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 88-NFPA 54-2024 [Section No. K.1.2.8]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello

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Submittal Date: Sat Jun 01 12:18:15 EDT 2024

Committee: NFG-AAA

Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]

~~3.3.4.4.2 Gas Deep Fat Fryer.~~

~~An appliance, including a cooking vessel in which oils or fats are placed to such a depth that the cooking food is essentially supported by displacement of the cooking fluid or a~~

~~perforated container immersed in the cooking fluid rather than by the bottom of the vessel, designed primarily for use in hotels, restaurants, clubs, and similar institutions.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Gas Deep Fat Fryer. The term is not used in the Code. It is used in Annex A. See PI 2.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	
Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]	
Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]	
Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]	
Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]	
Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]	

Submitter Information Verification

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Submittal Date: Wed Feb 28 10:46:24 EST 2024

Committee: NFG-AAA

Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]

~~3.3.4.4.3 Kettle.~~

~~An appliance with a cooking chamber that is heated either by a steam jacket in which steam is generated by gas heat or by direct gas heat applied to the cooking chamber.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Kettle. The term is not used in the Code. It is used in Annex A: A.10.11.2.1 Examples of floor-mounted food service appliances include ranges for hotels and restaurants, deep fat fryers, unit broilers, kettles, steam cookers, steam generators, and baking and roasting ovens. Inclusion in a list of examples of the type of appliance is not sufficient to require a definition of the term. It is noted that the term is defined in most dictionaries.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]	
Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]	
Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]	
Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]	
Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]	
Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]	
Public Input No. 9-NFPA 54-2024 [Section No. 3.3.4.4.4]	

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Submittal Date: Wed Feb 28 09:44:37 EST 2024

Committee: NFG-AAA

Public Input No. 9-NFPA 54-2024 [Section No. 3.3.4.4.4]

~~3.3.4.4.4 Steam Cooker.~~

~~An appliance that cooks, defrosts, or reconstitutes food by direct contact with steam.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Steam Cooker. The term is not used in the code. It is used in It is used in A.10.11.2.1. See substantiation for PI 2.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	

Submitter Information Verification

Submitter Full Name: Theodore Lemoff

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Submittal Date: Thu Feb 29 11:27:57 EST 2024

Committee: NFG-AAA

Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]

~~3.3.4.4.5 Steam Generator.~~

~~A separate appliance primarily intended to supply steam for use with food service appliances.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Steam Kettle. The term is not used in the code. It is used in Annex A. See PI 2.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	
Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]	
Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]	
Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]	
Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]	
Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]	

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Submittal Date: Wed Feb 28 10:16:29 EST 2024
Committee: NFG-AAA

Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]

~~3.3.13 Breeching.~~

~~See 3.3.101, Vent Connector.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Breeching. The term is not used in the Code.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	
Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]	
Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]	
Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]	
Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]	
Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]	

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Submittal Date: Wed Feb 28 10:22:15 EST 2024

Committee: NFG-AAA

Public Input No. 11-NFPA 54-2024 [Section No. 3.3.16.5.1]

~~3.3.16.5.1 Fan-Assisted Power Burner.~~

~~A burner that uses either induced or forced draft.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Fan-Assisted Power Burner. Delete. The term is not used in the code. The term “Power Burner” is defined, and is sufficient to allow readers to understand what a Fan-Assisted Power Burner is.

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Submittal Date: Thu Feb 29 11:37:05 EST 2024
Committee: NFG-AAA

Public Input No. 117-NFPA 54-2024 [Section No. 3.3.49 [Excluding any Sub-Sections]]

Include natural gas, manufactured gas, liquefied petroleum (LP) gas in the vapor phase only, liquefied petroleum gas–air mixtures, and mixtures of these gases, plus gas–air mixtures within the flammable range, with the fuel gas or the flammable component of a mixture being a commercially distributed product and natural gas containing up to and including 5 percent hydrogen gas by volume.

Statement of Problem and Substantiation for Public Input

Consensus among technical experts and standards developers (principally CSA Group, the most prominent ANSI-recognized consensus standards development organization – SDO – for natural gas appliances and equipment) has determined that natural gases with up and including 5% hydrogen by volume is technically equivalent in terms of resulting combustion behavior (the most sensitive fuel quality characteristic that is composition dependent) to the natural gas into which is its admixed (i.e., “blended”) as a “baseline gas.” CSA standards development going forward and retroactively recognize this equivalency and will not impose any difference in requirements or standards recognition of admixtures up to and including 5% by volume. This conclusion is backed up with all published available appliance testing, historical treatment of natural gas compositions in test gases administered in standards approval testing, and gas properties analysis using standard natural gas interchangeability calculations applied to multiple baseline gases and admixtures of hydrogen with those gases. As a consequence, hydrogen concentrations up to and including 5% in natural gas is recognized by CSA Group and other technical experts as “natural gas,” regardless of the source of hydrogen (i.e., admixing by design of natural gas supply or otherwise included part of natural gas supply composition).

Submitter Information Verification

Submitter Full Name: Ted Williams

Organization: Natural Gas Direct, LLC.

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Submittal Date: Tue Jun 04 16:12:16 EDT 2024

Committee: NFG-AAA

Public Input No. 118-NFPA 54-2024 [New Section after 3.3.59]

TITLE OF NEW CONTENT

3.3.59 Hydrogen Admixture. A natural gas supply into which hydrogen is blended or mixed at concentrations greater than 5 percent by volume by the fuel supplier or at the point of delivery.

Statement of Problem and Substantiation for Public Input

Given the proposed change in the definition of “fuel gas” to include natural gas containing up to and including 5% by volume, formal recognition of “hydrogen admixtures” is reserved to admixtures greater than 5%. Hydrogen admixtures are proposed by gas suppliers as a means of reducing airborne carbon emissions by displacing methane in natural gas with hydrogen, for which combustion produces no carbon dioxide and thus represents an opportunity for gas suppliers to reduce carbon emissions by adjusting chemical composition of natural gas baseline fuel gas. Specific technical requirements may be called for in addressing hydrogen admixtures of increasing hydrogen percent concentrations, but this definition does not call for such specifications since they represent requirements best considered outside of the definition.

Submitter Information Verification

Submitter Full Name: Ted Williams

Organization: Natural Gas Direct, LLC.

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Submittal Date: Tue Jun 04 16:15:36 EDT 2024

Committee: NFG-AAA

Public Input No. 76-NFPA 54-2024 [Section No. 3.3.83]

3.3.83 Qualified Agency.

Any individual, firm, corporation, or company that either in person or through a representative is engaged in and is responsible for (1) the design, installation, testing, or replacement of gas piping or (2) the connection, installation, testing, repair, or servicing of appliances and equipment; that is ~~experienced in~~ qualified in such work; that is familiar with

all precautions required; and that has complied with all the requirements of the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Being qualified to do something provides a much stronger basis for competence than simply saying someone is experienced. Saying that someone is experienced, does not mean successful experience, and it does not mean more than once.

Submitter Information Verification

Submitter Full Name: Sean George
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Submittal Date: Wed May 29 20:46:15 EDT 2024
Committee: NFG-AAA

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Public Input No. 77-NFPA 54-2024 [Section No. 3.3.83]

3.3.83 Qualified Agency.

Any individual, firm, corporation, or company that either in person or through a representative is engaged in and is responsible for (1) the design, installation, testing, or replacement of gas piping or (2) the connection, installation, testing, repair, or servicing of appliances and equipment; that is experienced in such work; that is ~~familiar with~~ trained with all precautions required; and that has complied with all the requirements of the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

Merriam Webster says that familiar means acquainted, trained means proficient and qualified. It does not serve the purpose of public safety to have entities such as qualified agencies work

with hazardous natural gas when they are only required to be acquainted and not proficient and qualified.

Submitter Information Verification

Submitter Full Name: Sean George
Organization: Steamfitters LU 449-Pittsburgh
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Submittal Date: Wed May 29 20:59:29 EDT 2024
Committee: NFG-AAA

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By checking this box I affirm that I am Sean George, and I agree to be legally bound by the above Copyright Assignment and the terms and conditions contained therein. I understand and intend that, by checking this box, I am creating an electronic signature that will, upon my submission of this form, have the same legal force and effect as a handwritten signature

Public Input No. 78-NFPA 54-2024 [Section No. 3.3.83]

3.3.83 Qualified Agency.

~~Any individual, firm, corporation, or company that either in person or through a representative is engaged~~ A trained competent person representing themselves or a business entity that is engaged in and is responsible for (1) the design, installation, testing, or replacement of gas piping or (2) the connection, installation, testing, repair, or servicing of appliances and equipment~~; that is experienced in such work; that is familiar with all precautions required; and that has complied with all the requirements of the authority having jurisdiction.~~.

Statement of Problem and Substantiation for Public Input

The previous definition never identified the need for this person to be competent. An OSHA "competent person" is defined as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them" [29 CFR 1926.32(f)]. The previous definition allowed for a representative that had no qualifications to be engaged in the work for a firm, corporation, or company. Firm,

corporation, or company are the same thing. The previous definition never required anyone to be trained.

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Committee: NFG-AAA

Public Input No. 92-NFPA 54-2024 [Section No. 3.3.83]

3.3.83 Qualified Agency.

Any individual, firm, corporation, or company that either in person or through a representative is engaged in and is responsible for (1) the design, installation, testing, removal or replacement of gas piping or (2) the connection, installation, testing, repair, or servicing of appliances and equipment; that is experienced in such work; that is familiar with all precautions required; and that has complied with all the requirements of the authority having jurisdiction.

Statement of Problem and Substantiation for Public Input

In Youngstown, Ohio on or about May 31 a demolition crew cut into gas piping in the basement of a commercial building while removing piping. The resulting explosion took the life of a 27 year old man and injured 7 others. Requiring this "removal or demolition" work to be done by a qualified agency reduces the risks of this kind of event in the future.

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Committee: NFG-AAA

Public Input No. 10-NFPA 54-2024 [Section No. 3.3.93]

~~3.3.93 Steam Cooker.~~

~~See 3.3.4.4.4, Steam Cooker.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Steam Cooker. It references another definition of Steam Cooker. Two entries for the same term is excessive.

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Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]

~~3.3.99.2 Automatic Valve.~~

~~An automatic or semiautomatic device consisting essentially of a valve and operator that control the gas supply to the burner(s) during operation of an appliance.~~

Statement of Problem and Substantiation for Public Input

Delete definition of Automatic Valve. The term is not used in the Code or in Annexes A thru H.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	
Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]	
Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]	
Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]	
Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]	
Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]	

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Committee: NFG-AAA

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Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]

~~3.3.99.4 Manual Reset Valve.~~

~~An automatic shutoff valve installed in the gas supply piping and set to shut off when unsafe conditions occur. The device remains closed until manually reopened.~~

Statement of Problem and Substantiation for Public Input

Delete definition of Manual Reset Valve. The term is not used in the Code or in Annexes A thru H.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	
Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]	
Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]	
Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]	
Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]	
Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]	

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Committee: NFG-AAA

Public Input No. 8-NFPA 54-2024 [Section No. 3.3.99.6]

~~3.3.99.6 Service Shutoff Valve.~~

~~A valve, installed by the serving gas supplier between the source of supply and the customer piping system, to shut off the fuel gas to the entire piping system.~~

Statement of Problem and Substantiation for Public Input

Delete the definition of Service Shutoff Valve. The term is used only in the Code's scope in 1.1.1.1 (A). If the committee believes that the term is not self defining, revise 1.1.1.1(A) to incorporate the definition to make is easier for users to understand the intent of the requirement.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 2-NFPA 54-2024 [Section No. 3.3.4.4.3]	
Public Input No. 3-NFPA 54-2024 [Section No. 3.3.4.4.5]	
Public Input No. 4-NFPA 54-2024 [Section No. 3.3.13]	
Public Input No. 5-NFPA 54-2024 [Section No. 3.3.4.4.2]	
Public Input No. 6-NFPA 54-2024 [Section No. 3.3.99.2]	
Public Input No. 7-NFPA 54-2024 [Section No. 3.3.99.4]	

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Public Input No. 119-NFPA 54-2024 [Chapter 4]

Chapter 4 General

4.1 Qualified Agency.

The following shall be performed only by a qualified agency:

(1) The design, installation, testing, purging, and replacement of gas piping, appliances, equipment, and accessories

(2) The repair and servicing of appliances and equipment

4.2 Interruption of Service.

4.2.1 Notification of Interrupted Service.

When the gas supply is to be turned off, it shall be the duty of the qualified agency to notify all affected users. Where two or more users are served from the same supply system, precautions shall be exercised to ensure that service only to the proper user is turned off.

Exception: In cases of emergency, affected users shall be notified as soon as possible of the actions taken by the qualified agency.

4.2.2 Work Interruptions.

When interruptions in work occur while repairs or alterations are being made to an existing piping system, the system shall be left in a safe condition.

4.3 Prevention of Accidental Ignition.

4.3.1 Potential Ignition Sources.

Where work is being performed on piping that contains or has contained gas, the following shall apply:

(1) Provisions for electrical continuity shall be made before alterations are made in a metallic piping system.

(2) Smoking, open flames, lanterns, welding, or other sources of ignition shall not be permitted.

(3) A metallic electrical bond shall be installed around the location of cuts in metallic gas pipes made by other than cutting torches. Where cutting torches, welding, or other sources of ignition are to be used, it shall be determined that all sources of gas or gas–air mixtures have been secured and that all flammable gas or liquids have been cleared from the area. Piping shall be purged as required in Section 8.3 before welding or cutting with a torch is attempted.

(4) Artificial illumination shall be restricted to listed safety-type flashlights and safety lamps. Electric switches shall not be turned on or turned off.

4.3.2 Handling of Flammable Liquids.

4.3.2.1* Drip Liquids.

Liquid that is removed from a drip in existing gas piping shall be handled to avoid spillage or ignition.

4.3.2.2 Other Flammable Liquids.

Flammable liquids used by the installer shall be handled with precaution and shall not be left within the premises from the end of one working day to the beginning of the next.

4.4* Noncombustible Material.

A material that complies with any of the following shall be considered a noncombustible material:

(1) A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat

(2) A material that is reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*

(3) A material that is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*

4.5 Engineering Methods.

Where an engineering method is used to calculate flow of air or gas, or to determine the size of gas pipe or a gas vent, the authority having jurisdiction shall be permitted to require submittal of any or all of the following:

(1) Calculations including documentation that the method used is published and recognized as being valid for the calculations provided

(2) The name of any software used, input and output developed, and documentation that the software is recognized as being valid for the calculations provided

(3) *The name of the person that performed the calculation or design, along with their qualifications to perform the calculation or design.

4.6 Hydrogen Admixtures. For the scope, purpose, and requirements of this code, hydrogen admixtures in natural gas supplies shall not exceed 20 percent by volume.

Statement of Problem and Substantiation for Public Input

The current state of knowledge around hydrogen admixtures of natural gas has concluded that 20% hydrogen by volume represents a prudent upper bound for gas suppliers used in existing and new natural gas appliances and equipment from a standpoint of appliance and gas system safety. This knowledge is based upon appliance testing, combustion properties associated with interchangeability to the baseline natural gas used for admixing, uncertainties associated with non-combustion characteristics of admixtures upon natural gas piping systems and components, and known current gas supplier plans for hydrogen admixtures that do not exceed 20% for near term projects, higher heating value (HHV) limits of natural gas suppliers and the decrements of HHV associated with hydrogen fractions (hydrogen representing roughly one-third the HHV of methane). At a minimum, a 20% admixture limit serves as a reasonable limit for hydrogen admixtures for the current code cycle and as research and analysis continues to test this threshold as an upper bound. This limit may change if technically justified on past, current, and future designs of appliance, equipment, and building gas systems, but exceeding 20% is not justified at this time.

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Submittal Date: Tue Jun 04 16:19:44 EDT 2024

Committee: NFG-AAA

Public Input No. 120-NFPA 54-2024 [Chapter 4]

Chapter 4 General

4.1 Qualified Agency.

The following shall be performed only by a qualified agency:

(1) The design, installation, testing, purging, and replacement of gas piping, appliances, equipment, and accessories

(2) The repair and servicing of appliances and equipment

4.2 Interruption of Service.

4.2.1 Notification of Interrupted Service.

When the gas supply is to be turned off, it shall be the duty of the qualified agency to notify all affected users. Where two or more users are served from the same supply system, precautions shall be exercised to ensure that service only to the proper user is turned off.

Exception: In cases of emergency, affected users shall be notified as soon as possible of the actions taken by the qualified agency.

4.2.2 Work Interruptions.

When interruptions in work occur while repairs or alterations are being made to an existing piping system, the system shall be left in a safe condition.

4.3 Prevention of Accidental Ignition.

4.3.1 Potential Ignition Sources.

Where work is being performed on piping that contains or has contained gas, the following shall apply:

(1) Provisions for electrical continuity shall be made before alterations are made in a metallic piping system.

(2) Smoking, open flames, lanterns, welding, or other sources of ignition shall not be permitted.

(3) A metallic electrical bond shall be installed around the location of cuts in metallic gas pipes made by other than cutting torches. Where cutting torches, welding, or other sources of ignition are to be used, it shall be determined that all sources of gas or gas–air mixtures have been secured and that all flammable gas or liquids have been cleared from the area. Piping shall be purged as required in Section 8.3 before welding or cutting with a torch is attempted.

(4) Artificial illumination shall be restricted to listed safety-type flashlights and safety lamps. Electric switches shall not be turned on or turned off.

4.3.2 Handling of Flammable Liquids.

4.3.2.1* Drip Liquids.

Liquid that is removed from a drip in existing gas piping shall be handled to avoid spillage or ignition.

4.3.2.2 Other Flammable Liquids.

Flammable liquids used by the installer shall be handled with precaution and shall not be left within the premises from the end of one working day to the beginning of the next.

4.4* Noncombustible Material.

A material that complies with any of the following shall be considered a noncombustible material:

(1) A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat

(2) A material that is reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*

(3) A material that is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*

4.5 Engineering Methods.

Where an engineering method is used to calculate flow of air or gas, or to determine the size of gas pipe or a gas vent, the authority having jurisdiction shall be permitted to require submittal of any or all of the following:

(1) Calculations including documentation that the method used is published and recognized as being valid for the calculations provided

(2) The name of any software used, input and output developed, and documentation that the software is recognized as being valid for the calculations provided

(3) *The name of the person that performed the calculation or design, along with their qualifications to perform the calculation or design.

A4.6 Safe distribution of hydrogen admixtures in natural gas and use in building systems do not appear to present issues of safety or operability when prudent limits on hydrogen percentages (by volume) are used. Pipe sizing criteria used in the National Fuel Gas Code specific to natural gas (as well as propane) do not appear to warrant specific adjustments for hydrogen admixtures provided the admixtures do not significantly lead to deviate natural gas fuel gas properties from the currently-assumed density of 0.60 relative to dry air and higher heating value (HHV) of 1,024 Btus per standard cubic foot (Btu/scf). Generally, however, the higher the admixture hydrogen percentage, the less reliable continued safety and operability can be presumed. A more immediate impact of hydrogen admixture percentages and percentage increases is demonstrated and predicted impacts upon end use appliance and equipment (hereafter referred to as “appliance”) function, most directly represented by combustion behavior effects. The principal and most immediate safety concern of increasing admixture percentages is on burner “flashback” where flame fronts in burners retreat into the burner itself, leading to burner failure and consequent destruction of the burner system and potential destruction of release of unburned gas in the building environment. Regression of flame fronts into burners occurs when hydrogen fractions increase gas mixture flame speed in excess of flow velocity, hydrogen burning at a burning velocity approximately six times faster than that of methane. A 20% maximum threshold for hydrogn admixtures with natural gas represents a prudent limit to minimize the potential of flashback behavior and associated safety risks of burner failure.

Statement of Problem and Substantiation for Public Input

The annex material would provide useful information to National Fuel Gas Code users on the need to adhere to hydrogen admixture maximum threshold limits in order to mitigate health

and safety risks associated with flashback and subsequent burner failure and that is substantiated by appliance testing, gas properties analysis, gas interchangeability analysis, and various non-technical limits on gas composition that would otherwise compromise the appropriateness of hydrogen admixtures in natural gases.

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Committee: NFG-AAA

Public Input No. 90-NFPA 54-2024 [Section No. 4.1]

4.1 Qualified Agency.

4.1.1 Work Scope

The following shall be performed only by a qualified agency:

(1) The design, installation, testing, purging, removal, and replacement of gas piping, appliances, equipment, and accessories

(2) The repair and servicing of appliances and equipment

Statement of Problem and Substantiation for Public Input

In some cases gas piping is removed and not replaced. This would refer to the demolition industry. On or about May 31, 2024 workers were removing gas pipes from the basement of a building in downtown Youngstown, Ohio. They cut a pipe that contained pressurized natural gas. A horrendous explosion occurred taking the life of a 27 year old man and injuring 7 others while also devastating a community trying to rebuild its inner city infrastructure. A requirement

to make sure people doing gas piping demolition are part of a qualified agency and are trained reduces the risk of this ever happening again.

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Public Input No. 91-NFPA 54-2024 [Section No. 4.1]

4.1 Qualified Agency.

~~The following shall be performed only by a qualified agency:~~

~~(1) The design, installation, testing, purging, and replacement of gas piping, appliances, equipment, and accessories~~

~~(2) The repair and servicing of appliances and equipment~~

4.1.2 Qualification of Personnel

Persons whose duties fall within the scope of this code shall be provided with training consistent with the scope of their job activities that includes the following:

a) Proper gas piping materials selection, pipe joining methods, leak checking, purging, and emergency response procedures.

b) Training shall be provided in a language and at a literacy level that employees understand, and that the training provides an opportunity for interactive questions and answers with the instructor/trainer.

c) A training plan shall be created for both initial and ongoing needs including refresher training.

d) Training shall be commensurate with all employee exposure hazards. The employer shall provide a training hazards matrix as part of the training plan.

e) Training resources shall be provided to those trained to include reference materials for self-study future review.

f) The training program shall include validation of both knowledge and skills transfer.

g) Validation of skills transfer shall include witness sign-offs by competent persons.

h) Validation of knowledge transfer shall include written tests administered in a controlled environment with results provided to the trainees along with documented discussions of each test item.

Statement of Problem and Substantiation for Public Input

This document is one of the few documents within all published by NFPA that requires no training. Even the parallel sister document for LPG, (NFPA 58) requires training. Human error is known as the number one cause of accidents. Training reduces human error risks. Requiring training for those working with gas piping systems will serve the public and the gas industry in general by reducing accidents overall.

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Public Input No. 46-NFPA 54-2024 [New Section after 4.2]

4.2.1 Qualified Agency Training

Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities.

4.2.1.1 Training Requirements.

Training shall meet the following requirements

a) Shall be Documented with a written curriculum

b) Shall include validation of knowledge transfer.

c) Shall include validation of skills transfer.

d) Shall be provided in a language and at a literacy level that employees understand,

e) Shall provide an opportunity for interactive questions and answers with the instructor/trainer.

4.2.1.2 Refresher training

Refresher training shall be provided at least every 3 years.

Statement of Problem and Substantiation for Public Input

Human error has been recognized for decades as the #1 cause of accidents. Almost every other significant document that deals with fuels or fired equipment including NFPA 58, 85, and 86 contain a section on training. It makes no sense that the keystone document within NFPA that covers natural gas has no mention of anyone needing to be trained for doing any of the critical work that is the subject of NFPA 54 where lives are literally at stake with almost everything in the document. This requirement can significantly advance the cause of safety in the natural gas industry and provide enhanced safety to the public.

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Committee: NFG-AAA

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Public Input No. 79-NFPA 54-2024 [Section No. 4.2.1]

4.2.1 Notification of Interrupted Service.

When the gas supply is to be turned off ~~, it shall be~~ the ~~duty of the qualified agency to~~ qualified agency shall notify all affected users. Where two or more users are served from the same supply system, precautions shall be exercised to ensure that service only to the proper user is turned off.

Exception: In cases of emergency, affected users shall be notified as soon as possible of the actions taken by the qualified agency.

Statement of Problem and Substantiation for Public Input

What is important is that notification occur. As the qualified agency is interrupting the service, they are the only one who are aware of every turnoff. The deleted phrase is not needed to ensure that notification occurs. It is noted that this is the only paragraph in the code that uses the phrase, “it shall be the duty”.

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Public Input No. 54-NFPA 54-2024 [Section No. 4.3.1]

4.3.1 Potential Ignition Sources.

Where work is being performed on piping that ~~contains or~~ has contained gas and does not require purging as per Section 8.3, the following shall apply:

(1) Provisions for electrical continuity shall be made before alterations are made in a metallic piping system.

(2) ~~Smoking, open flames, lanterns, welding, or other sources of ignition shall not be permitted.~~

(1) A metallic electrical bond shall be installed around the location of cuts in metallic gas pipes made by other than cutting torches.

(1) Where cutting torches, welding, or other sources of ignition are to be used, it shall be determined that all sources of gas or gas–air mixtures have been secured and that all flammable gas or liquids have been cleared from the area.

~~Piping shall be purged as required in Section 8.3 before welding or cutting with a torch is attempted.~~

(1)

(2) Smoking, open flames, lanterns, welding, or other sources of ignition shall not be permitted.

(2) Artificial illumination shall be restricted to listed safety-type flashlights and safety lamps.

~~Electric switches shall not be turned on or turned off.~~

(2)

(4) The work area shall be well-ventilated.

(4) The work area shall be verified to be at less than 10% LEL with a flammable gas detector at all times.

Statement of Problem and Substantiation for Public Input

Several changes were proposed, substantiation for each follows: 1. Organized topics in the list according to their relation to each other. 2. Broke up shall statement requirements into separate items as per manual of style requirements. 3. Restated the opening statement since there. is no hazard to fuel piping systems that are in service and contain gas and have no leaks. 4. The opening statement previously suggested that gas piping can be opened and worked on without purging. 5. There are hazards related to working on piping that meet the deminimus requirements of table 8.3.1. Requirements for ventilation and monitoring of the space were added.

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Committee: NFG-AAA

Public Input No. 55-NFPA 54-2024 [Section No. 4.3.2]

~~4.3.2 Handling of Flammable Liquids.~~

~~4.3.2.1* Drip Liquids.~~

~~Liquid that is removed from a drip in existing gas piping shall be handled to avoid spillage or ignition.~~

~~4.3.2.2 Other Flammable Liquids.~~

~~Flammable liquids used by the installer shall be handled with precaution and shall not be left within the premises from the end of one working day to the beginning of the next.~~

Statement of Problem and Substantiation for Public Input

NFPA 30 flammable liquids code is the correct document to be providing advice on flammable liquids. This section is not within the scope of this document.

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Submittal Date: Sun May 26 18:29:38 EDT 2024

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Public Input No. 56-NFPA 54-2024 [Section No. 4.3.2.1]

~~4.3.2.1* Drip Liquids.~~

~~Liquid that is removed from a drip in existing gas piping shall be handled to avoid spillage or ignition.~~

Statement of Problem and Substantiation for Public Input

This item is a legacy item from the days when manufactured gas routinely had liquids. There is no longer an expectation that liquids are collected or exist in commercial natural gas distribution systems that are the subject of this document.

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Public Input No. 57-NFPA 54-2024 [Section No. 4.3.2.2]

~~4.3.2.2 Other Flammable Liquids.~~

~~Flammable liquids used by the installer shall be handled with precaution and shall not be left within the premises from the end of one working day to the beginning of the next.~~

Statement of Problem and Substantiation for Public Input

This item has two shall statement requirements. The first one is not enforceable. Its not clear what precautions would be taken? It's also not understandable how leaving a gallon of something on site would be a problem depending on how this was done. Again, this is not enforceable, is handled by NFPA 30 and is most likely a legacy item from manufactured gas days.

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Submittal Date: Sun May 26 18:35:32 EDT 2024

Committee: NFG-AAA

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Public Input No. 58-NFPA 54-2024 [Section No. 4.4]

MOVE THIS TO DEFINITIONS 3.3.65.2

4.4* Noncombustible Material.

A material that complies with any of the following shall be considered a noncombustible material:

(1) A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat

(2) A material that is reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*

(3) A material that is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*

Statement of Problem and Substantiation for Public Input

There is already a spot for this item in definitions right next to combustible materials. There is no reason for this to be in chapter 4.

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Public Input No. 48-NFPA 54-2024 [Section No. 4.5]

~~4.5 Engineering Methods.~~

~~Where an engineering method is used to calculate flow of air or gas, or to determine the size of gas pipe or a gas vent, the authority having jurisdiction shall be permitted to require submittal of any or all of the following:~~

~~(1) Calculations including documentation that the method used is published and recognized as being valid for the calculations provided~~

~~(2) The name of any software used, input and output developed, and documentation that the software is recognized as being valid for the calculations provided~~

~~(3) *The name of the person that performed the calculation or design, along with their qualifications to perform the calculation or design~~

Statement of Problem and Substantiation for Public Input

This section belongs in pipe sizing, chapter 6, section 6.2

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Committee: NFG-AAA

Public Input No. 52-NFPA 54-2024 [Section No. 5.2.1]

5.2.1 Interconnections Supplying Separate Users.

Where two or more meters, or two or more service regulators where meters are not provided, are located on the same premises and supply separate users, the gas piping systems shall not be interconnected on the outlet side of the meters or service regulators.

Exception: Unless in an industrial application and the interconnection is approved by the AHJ.

Statement of Problem and Substantiation for Public Input

Many industrial applications have interconnected piping systems supplied by different service regulators or meters. The interconnections are provided for reliability and redundancy.

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Public Input No. 53-NFPA 54-2024 [Section No. 5.2.2.2]

5.2.2.2

~~A three~~Acceptable equipment for preventing backflow shall be one of the following:

a) A Three-way valve ~~installed~~ , that has no intermediate position flow path, installed to admit the standby supply and at the same ~~time shut~~ time shut off the regular supply ~~shall be permitted to be used for this purpose.~~ .

b) Two isolation valves in series.

c) A single isolation valve with a blind.

Statement of Problem and Substantiation for Public Input

The way this is written provides inadequate means for enforcement. There are many 3 way valves manufactured that are not rated for positive shut off in some intermediate position. If not completely at a stop position they can leak through when appearing to be at their complete travel. The way this is written it sounds like one isolation valve would also be acceptable when in practice this would be dangerous given the potential for having one isolation valve leak through when closed. The proposed language also makes it clear that other devices like a check valve are not acceptable. The proposed language identifies robust positive shut off technologies and makes the choices clear.

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Committee: NFG-AAA

Public Input No. 98-NFPA 54-2024 [Section No. 5.3.2.3]

5.3.2.3

The total connected hourly load shall be used as the basis for piping sizing, assuming all appliances are operating at full capacity simultaneously.

Exception: Sizing shall be permitted to be based upon established load diversity factors or interlocked processes or appliances that restrict simultaneous operation.

Statement of Problem and Substantiation for Public Input

Many industrial processes and appliances have installed redundant spares. Sizing piping for both systems to be operated simultaneously would be burdensome to these processes and appliances where interlocks to prevent simultaneous operation exist.

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Public Input No. 12-NFPA 54-2024 [New Section after 5.5.4.1]

5.5.4.1.1.1

Polyamide mechanical fittings for use on polyethylene pipe and tubing shall comply with ASTM F1924, *Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing*.

Statement of Problem and Substantiation for Public Input

The current standard (ASTM D2513), referenced in section 5.5.4.1.1, allows for the use of mechanical fittings, but it only covers fittings made of polyethylene. ASTM F1924, "Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing" is written as a supplement to D2513. It defines

requirements for plastic mechanical fittings specifically for use on ASTM D2513 systems and allows for the use of fittings constructed of all plastic materials, provided they are compatible with ASTM D2513 piping systems. ASTM F1924 is an established standard with over 25 years of history. Including ASTM F1924 will increase the fittings available for use on gas systems while maintaining the safety and reliability of those systems.

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Committee: NFG-AAA

Public Input No. 65-NFPA 54-2024 [Section No. 5.5.4.1.1]

5.5.4.1.1

Polyethylene plastic pipe, tubing, and fittings used to supply fuel gas shall conform to ASTM D2513, *Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings.* Pipe to be used shall be marked “gas” and “ASTM D2513.” Polyethylene plastic pipe, tubing, and fittings shall not be installed indoors or aboveground.

Statement of Problem and Substantiation for Public Input

Section 7.1.7 states that polyethylene plastic piping is not permitted indoors or aboveground. Mirroring this requirement to section 5.5, which discusses the applicability of piping materials, will assist in the ease of use of the standard.

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Committee: NFG-AAA

Public Input No. 115-NFPA 54-2024 [Section No. 5.5.4.2]

5.5.4.2* Regulator Vent Piping.

Plastic pipe and fittings used to connect regulator vents to remote vent terminations shall be PVC conforming to UL 651, *Schedule 40 and 80 Rigid PVC Conduit and Fittings*. ~~PVC vent piping shall not be installed indoors.~~

Statement of Problem and Substantiation for Public Input

Since the 2001 edition, NFPA 58 “LP-Gas Code” has allowed the use of PVC conforming to ANSI/UL 651 to be exposed to the indoors where used to vent second stage regulators that are installed indoors. 1. In a large structure involved in fire, regulator vent piping may be exposed to fire while the regulator itself may not be. It is important to note that under most circumstances, regulator vent piping does not contain gas—it only carries gas when the regulator is in vent discharge mode. If the regulator itself is not involved in a fire, there is no reasonable expectation to believe that it will vent and therefore involvement of the vent piping alone in a fire does not pose any additional safety risk. 2. Using black iron or galvanized pipe or larger diameter copper tubing could impose excessive stresses on the regulator housing. When regulators had 1/4- inch vent openings, small diameter tubing used to extend vents imposed minimal stress on the regulator. However, regulators now install 1/2-, 3/4-, and 1-inch vent openings which lead to much greater stresses on the housing. 3. UL 651 PVC conduit is tested for limited resistance to fire. However, LP-gas second stage and line pressure regulators, which are both approved for use inside buildings, are not required to be fire resistant. Regulators contain components which have low melting points. Plastic regulator vent caps and adjusting screws will melt at temperatures as low as 225°F, and the elastomer materials of regulator diaphragms and seat discs will fail at approximately 400°F. The melting

point of PVC gas pipe ranges from 212°F to 500°F. Therefore, there is no enhancement of safety in mandating fire-resistant vent piping, when the regulator assembly itself is not tested for fire resistance.

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Submittal Date: Tue Jun 04 10:09:14 EDT 2024

Committee: NFG-AAA

Public Input No. 116-NFPA 54-2024 [Section No. 5.5.5]

5.5.5 Workmanship and Defects.

Gas pipe, tubing, and fittings at the time of installation shall meet the following requirements:

(1) Gas pipe, tubing, and fittings shall be clear and free from cutting burrs and visible defects in structure or threading.

(2) Gas pipe, tubing, and fittings shall be ~~thoroughly~~ cleaned to remove chip, scale, and debris.

(3) ~~Visible defects in pipe, tubing, and fittings shall not be repaired.~~

(3)

(4) Pipe, tubing, and fittings with visible defects shall be replaced.

Statement of Problem and Substantiation for Public Input

Revised to: 1. Delete Thoroughly. The requirement for cleaning is sufficient. The modifier “thoroughly” is not enforceable as degree of cleaning is subjective. 2. Delete a redundant requirement. Saying that visible defects shall not be repaired is not needed when they are required to be replaced in the next sub-paragraph.

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Committee: NFG-AAA

Public Input No. 51-NFPA 54-2024 [Sections 5.5.7.1, 5.5.7.2, 5.5.7.3, 5.5.7.4, 5.5.7.5]

Sections 5.5.7.1, 5.5.7.2, 5.5.7.3, 5.5.7.4, 5.5.7.5

~~5.5.7.1* Pipe Joints.~~

~~Schedule 40 and heavier pipe joints shall be threaded, flanged, brazed, welded, or assembled with press-connect fittings listed to ANSI LC 4/CSA 6.32, *Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems*.~~

~~(A)~~

~~Pipe lighter than Schedule 40 shall be connected using press-connect fittings, flanges, brazing, or welding.~~

~~(B)~~

~~Where nonferrous pipe is brazed, the brazing materials shall have a melting point in excess of 1000°F (538°C).~~

(C)

Brazing alloys shall not contain more than 0.05 percent phosphorus.

5.5.7.2 Copper Tubing Joints.

Copper tubing joints shall be assembled with approved gas tubing fittings, shall be brazed with a material having a melting point in excess of 1000°F (538°C), or shall be assembled with press-connect fittings listed to ANSI LC 4/CSA 6.32, *Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems*. Brazing alloys shall not contain more than 0.05 percent phosphorus.

5.5.7.3 Stainless Steel Tubing Joints.

Stainless steel joints shall be welded, assembled with approved tubing fittings, brazed with a material having a melting point in excess of 1000°F (538°C), or assembled with press-connect fittings listed to ANSI LC 4/CSA 6.32, *Press-Connect Metallic Fittings for Use in Fuel Gas Distribution Systems*. Brazing alloys and fluxes shall be recommended by the manufacturer for use on stainless steel alloys.

5.5.7.4 Flared Joints.

Flared joints shall be used only in systems constructed from nonferrous pipe and tubing where experience or tests have demonstrated that the joint is suitable for the conditions and where provisions are made in the design to prevent separation of the joints.

5.5.7.5 Metallic Pipe Fittings.

Metallic fittings shall comply with the following:

(1) Threaded fittings in sizes larger than 4 in. (100 mm) shall not be used.

(2) Fittings used with steel, stainless steel, or wrought-iron pipe shall be steel, stainless steel, copper alloy, malleable iron, or cast iron.

(3) Fittings used with copper or copper alloy pipe shall be copper or copper alloy.

(4) Fittings used with aluminum alloy pipe shall be aluminum alloy.

(5) *Cast-Iron Fittings.* Cast-iron fittings shall comply with the following:

(a) Flanges shall be permitted.

(b) Bushings shall not be used.

(c) Fittings shall not be used in systems containing flammable gas–air mixtures.

(d) Fittings in sizes 4 in. (100 mm) and larger shall not be used indoors unless approved.

(e) Fittings in sizes 6 in. (150 mm) and larger shall not be used unless approved.

(6) *Aluminum Alloy Fittings.* Threads shall not form the joint seal.

(7) *Zinc–Aluminum Alloy Fittings.* Fittings shall not be used in systems containing flammable gas–air mixtures.

(8) *Special Fittings.* Fittings such as couplings, proprietary-type joints, saddle tees, gland-type compression fittings, and flared, flareless, or compression-type tubing fittings shall be as follows:

(a) Used within the fitting manufacturer's pressure–temperature recommendations

~~(b) Used within the service conditions anticipated with respect to vibration, fatigue, thermal expansion, or contraction~~

~~(c) Acceptable to the authority having jurisdiction~~

~~(9) When pipe fittings are drilled and tapped in the field, the operation shall be in accordance with the following:~~

~~(a) The operation shall be performed on systems having operating pressures of 5 psi (34 kPa) or less.~~

~~(b) The operation shall be performed by the gas supplier or their designated representative.~~

~~(c) The drilling and tapping operation shall be performed in accordance with written procedures prepared by the gas supplier.~~

~~(d) The fittings shall be located outdoors.~~

~~(e) The tapped fitting assembly shall be inspected and proven to be free of leaks.~~

Delete and replace with the following:

Additional Proposed Changes

File Name	Description	Approved
Proposed_fittings_materials_table_May_23_PI_Only.docx		

Statement of Problem and Substantiation for Public Input

The requirements for fittings are converted into a table for ease of use and understanding. During the development of the table, it became evident at least one requirement is archaic, the inclusion of wrought iron pipe and fittings and it is deleted. While wrought iron is an acceptable material, wrought iron pipe and fittings are longer commercially available. The requirements for field frilling and tapped fittings are relocated to Chapter 7, as these are installation requirements, and not a materials requirement. The requirements for outdoor location and inspection are moved to separate requirements as they do not belong in this list of how to drill and tap.

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Committee: NFG-AAA

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Public Input No. 24-NFPA 54-2024 [Section No. 5.5.8]

~~5~~Relocate to paragraph 7.5.~~8 Plastic Piping Joints and Fittings.~~

~~Plastic pipe, tubing, and fittings shall be joined in accordance with the manufacturers' instructions. The following shall be observed when making such joints~~

2 and renumber as (5) through (9):

(1) The joint shall be designed and installed so that the longitudinal pullout resistance of the joint will be at least equal to the tensile strength of the plastic piping material.

(2) Heat fusion joints shall be made in accordance with qualified procedures that have been established and proven by test to produce gastight joints at least as strong as the pipe or tubing being joined. Joints shall be made with the joining method recommended by the pipe manufacturer. Polyethylene heat fusion fittings shall be marked "ASTM D2513." Polyamide heat fusion fittings shall be marked "ASTM F2945."

(3) Where compression-type mechanical joints are used, the gasket material in the fitting shall be compatible with the plastic piping and with the gas distributed by the system. An internal tubular rigid stiffener shall be used in conjunction with the fitting. The stiffener shall be flush with the end of the pipe or tubing and shall extend at least to the outside end of the compression fitting when installed. The stiffener shall be free of rough or sharp edges and shall not be a force fit in the plastic. Split tubular stiffeners shall not be used.

(4) Plastic piping joints and fittings for use in LP-Gas piping systems shall be in accordance with NFPA 58.

Statement of Problem and Substantiation for Public Input

Installation requirements are relocated to Chapter 7, Gas Piping Installatoion where they belong.

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Public Input No. 80-NFPA 54-2024 [Section No. 5.5.10 [Excluding any Sub-Sections]]

The material for gaskets shall be capable of withstanding:

1. the design temperature and pressure of the piping ~~system and~~ system

2. the chemical constituents of the gas being conducted without change to its chemical and physical properties.

3.The effects of fire exposure to the ~~joint shall be considered in choosing the material.~~joint

Statement of Problem and Substantiation for Public Input

As written the requirement is vague in respect to the ability of the gasket to withstand the effects of fire on the joint. It requires “consideration” which does not provide criteria for the material, only that someone thinks about it. As revised a requirement is added. In addition, the 3 requirements in the paragraph are separated in accordance with the Manual of Style.

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Committee: NFG-AAA

Public Input No. 67-NFPA 54-2024 [New Section after 5.7]

5.7.8 Test Ports

5.7.8.1 Test ports shall be provided upstream and downstream of the line pressure regulator to facilitate testing of the regulator after installation.

5.7.8.2 A tee fitting with one opening capped or plugged shall be installed between the regulator and its upstream shutoff valve to allow connection of a pressure-measuring instrument.

5.7.8.3 Means shall be provided downstream of, and in the same room as, the regulator for the connection of a pressure measuring instrument using any of the following:

1) dedicated test port on the regulator,

2) test port on the appliance gas control,

3) test port on the manifold,

4) a plugged tee fitting in the piping,

5) a plugged manifold port.

Statement of Problem and Substantiation for Public Input

A new requirement for test ports is added. Test ports are needed where the line pressure regulator is installed to allow the regulator to be tested to verify that it is operating properly. Improper operation can result in lower pressure than the appliance requires to operate safely and efficiently or higher pressure which can cause overfiring of the appliance.

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Public Input No. 13-NFPA 54-2024 [Section No. 5.7.2]

5.7.2 Listing.

~~Line~~ Except for appliances rated for pressures higher than 1/2 PSI and covered under NFPA 86, NFPA 87, NFPA 37, and NFPA 85, line pressure regulators shall be listed in accordance with ANSI Z21.80/CSA 6.22, *Line Pressure Regulators*, where the outlet pressure is set to 2 psi or less.

Statement of Problem and Substantiation for Public Input

The current language is inherently design limiting for higher flow appliances that are covered under the standards listed in the proposal. Higher flow means 5,000 cubic feet of natural gas or more. There is no regulator on the market that can comply with ANSI Z21.80 listed regulators and flow 12,500 (or more) cubic feet of natural gas at pressures less than 1/2 PSI. ANSI Z21.80 fits very well for residential and light commercial appliances that are listed under the Z21/83 series standards (and most of these are all less than 5,000 CFH) , but once the appliance is a larger commercial, industrial(light or heavy), or a gas engine (e.g. larger CAT engine), the requirement for an ANSI Z21.80 listed regulator either does not work or just complicates the installation. Additionally, what need or value does a ANSI Z21.80 listed regulator provide on such appliances that have high and low gas pressure switches and have not used ANSI Z21.80 listed regulators since time immemorial. In the previous editions, I offered an alternative to remove this design restriction by requiring either of the following: a ANSI Z21.80 regulator or have the appliance be fitted with a high and low gas pressure switches. That was rejected. So, please do something to fix this for these industries. The current requirement works great for residential and light commercial appliances that are listed

under the Z21/83 series standards. In most all cases, no one that makes unlisted appliances covered by NFPA 37 (except for small, 1/2 PSI rated, packaged gen sets), 86, 87 and 85 is able to comply with this requirement.

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Committee: NFG-AAA

Public Input No. 93-NFPA 54-2024 [Section No. 5.8.4]

5.8.4 Construction and Installation.

All overpressure protection devices shall be designed, constructed, and installed to meet the following requirements:

(1) ~~Be constructed of materials so that the~~ The operation of the device is not impaired by corrosion of external parts ~~by the atmosphere or of internal~~ , the ambient environment, or internal parts by the gas.

(2) Be ~~designed and installed so they can be operated~~ capable of being operated to determine whether the valve is free. ~~The devices shall also be designed and installed so they can be tested~~

(2) Be capable of being tested to determine the pressure at which they operate ~~and be~~ .

(2) Be capable of being examined for leakage, (through the device), when in the closed position.

Statement of Problem and Substantiation for Public Input

The previous language did not meet the manual of style requirements. It also spoke about not being impacted by the atmosphere. The term ambient environment is more descriptive and useful. The final requirement was modified to speak about leakage in the closed position through the device. This is the leakage path that is of concern in that requirement but it was not clear.

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Committee: NFG-AAA

Public Input No. 94-NFPA 54-2024 [Section No. 5.8.7]

5.8.7– Unauthorized Operation ~~-~~of Critical Isolation Valves

Where

~~unauthorized~~
operation of

~~any shutoff valve~~
an isolation valve could render a pressure relieving valve

~~or~~
, pressure limiting device inoperative, or a sensing line obstructed one of the following shall be

~~accomplished: The valve~~
implemented, 5.8.7.1 or 5.8.7.2.

5.8.7.1 Locking open of valves

(1) Critical isolation valves that can be closed and make for an obstruction shall be locked in the open position. ~~Instruct authorized personnel in the importance of leaving the shutoff valve open and of being present while the shutoff valve is closed so that it can be locked in the open position before leaving the premises.~~

~~Duplicate relief valves shall~~

(1)

(1) Personnel shall be trained to leave critical isolation valves open.

(1) Tags shall be placed on these valves to indicate their need to be open.

(1) Procedures shall be developed for verifying operation of tagged critical valves such that if they are closed for any reason while the system is out of service it will be returned to an open position before restarting equipment.

5.8.7.2 Duplicate overpressure control equipment

(2) Duplicate overpressure control equipment shall be installed, each having adequate capacity to protect the system~~, and arrange the~~ .

(2) Arrange isolating valves or a three-way valve so that only one relief valve can be rendered inoperative at a time.

Statement of Problem and Substantiation for Public Input

The previous language did not meet the manual of style having multiple shall statements bundled together. The requirements also called for instruction which is training and should be called out that way. It also called for instructions which are procedures and should be called out that way. The proposed language meets the manual of style requirements and provides a more clear precise set of requirements that allows the document to be used in manner that will enhance safety.

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Public Input No. 95-NFPA 54-2024 [Section No. 5.8.8]

~~5.8.8 Vents.~~

~~5.8.8.1~~

~~The discharge stacks, vents, or outlet parts of all pressure relieving and pressure limiting devices shall be located so that gas is safely discharged to the outdoors. Discharge stacks or vents shall be designed to prevent the entry of water, insects, or other foreign material that could cause blockage.~~

~~5.8.8.2~~

~~The discharge stack or vent line shall be at least the same size as the outlet of the pressure-relieving device.~~

Statement of Problem and Substantiation for Public Input

Much of the same information is already contained in section 5.14. There is only one such item that needs to be moved to this section to have all of this section's requirements also included below, rendering this section duplicative.

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Committee: NFG-AAA

Public Input No. 63-NFPA 54-2024 [Section No. 5.13]

5.13~~ Expansion and Flexibility~~ Design for expansion and flexibility.

5.13.1~~ Design.~~ Thermal expansion or contraction

Piping systems shall be designed to prevent failure from thermal expansion or contraction.

~~5.13.2 Special Local Conditions.~~

~~Where local conditions include earthquake, tornado, unstable ground, or flood hazards, special consideration shall be given to increased strength and flexibility of piping supports and connections.~~

Statement of Problem and Substantiation for Public Input

The title of this section should be about design. The section regarding consideration for special local considerations is not enforceable. It can never be clear what this consideration actually consists of. This is also a list, but it is not a complete list and the manual of style prefers lists not be given. For example, why is not icing on exterior gas piping also not on the list, or mudslides? What is flooding? Does this mean any flood zone? for a 100 year, 500 year, 1000 year storm?

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Committee: NFG-AAA

Public Input No. 96-NFPA 54-2024 [Section No. 5.14]

5.14 Pressure Regulator and Pressure Control Venting.

The venting of the atmospheric side of diaphragms in line-pressure regulators and gas-pressure-limit controls shall be in accordance with all of the following:

(1) An independent vent pipe to the outdoors, sized in accordance with the device manufacturer's instructions, shall be provided where the location of a device is such that a discharge of fuel gas will cause a hazard.

(2) Independent vents for multiple regulators shall not be required where the vents are connected to a common manifold designed in accordance with engineering methods to minimize backpressure in the event of diaphragm failure and such design is approved.

(3) A regulator and vent limiting means combination listed in accordance with ANSI Z21.80/CSA 6.22, *Line Pressure Regulators,* shall not be required to be vented to the outdoors.

(4) A listed gas appliance regulator factory equipped with a vent limiting device shall not be required to be vented to the outdoors.

(5) A listed gas pressure limit control that is factory equipped with a vent limiting device and in accordance with UL 353, *Limit Controls,* or UL 60730-2-6, *Automatic Electrical Controls for Household and Similar Use, Part 2,* shall not be required to be vented to the outdoors.

(6) Materials for vent piping shall be in accordance with Section 5.5.

(7) The vent terminus shall be designed to prevent the entry of water, insects, and other foreign matter that could cause blockage.

(8) Vent piping shall be installed to minimize static loads and bending moments placed on the regulators and gas pressure control devices.

(9) Vents shall terminate not less than 3 ft (0.9 m) from a possible source of ignition.

(10) At locations where a vent termination could be submerged during floods or snow accumulations, one of the following shall apply:

(a) An antiflood-type breather vent fitting shall be installed.

(b) The vent terminal shall be located above the height of the expected flood waters or snow.

(11) Vent piping from pressure regulators and gas pressure controls shall not be connected to a common manifold that serves a bleed line from a diaphragm-type gas valve.

(11) <u>The discharge stack or vent line shall be at least the same size as the outlet of the pressure relieving device.</u>

Statement of Problem and Substantiation for Public Input

The addition of this one item (12) allows section 5.8.8 to be removed from the document.

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Committee: NFG-AAA

Public Input No. 97-NFPA 54-2024 [Section No. 5.14]

5.14 Pressure Regulator and Pressure Control Venting.

The venting of the atmospheric side of diaphragms in line-pressure regulators and gas-pressure-limit controls shall be in accordance with all of the following:

(1) An independent vent pipe to the outdoors, sized in accordance with the device manufacturer's instructions, shall be provided where the location of a device ~~is~~ or its potential release of gas is such that a discharge ~~of fuel gas~~ will cause a hazard.

(2) Independent vents for multiple regulators shall not be required where the vents are connected to a common manifold designed in accordance with engineering methods to minimize backpressure in the event of diaphragm failure and such design is approved.

(3) A regulator and vent limiting means combination listed in accordance with ANSI Z21.80/CSA 6.22, *Line Pressure Regulators,* shall not be required to be vented to the outdoors.

(4) A listed gas appliance regulator factory equipped with a vent limiting device shall not be required to be vented to the outdoors.

(5) A listed gas pressure limit control that is factory equipped with a vent limiting device and in accordance with UL 353, *Limit Controls,* or UL 60730-2-6,

Automatic Electrical Controls for Household and Similar Use, Part 2, shall not be required to be vented to the outdoors.

(6) Materials for vent piping shall be in accordance with Section 5.5.

(7) The vent terminus shall be designed to prevent the entry of water, insects, and other foreign matter that could cause blockage.

(8) Vent piping shall be installed to minimize static loads and bending moments placed on the regulators and gas pressure control devices.

(9) Vents from diaphragm type regulators shall terminate not less than 3 ft (0.9 m) from a possible source of ignition.

(9) Vent terminations from from gas pressure relief valves or combination regulator relief valves shall have an engineering analysis completed to identify distances required from possible sources of ignition.

(10) At locations where a vent termination could be submerged during floods or snow accumulations, one of the following shall apply:

(a) An antiflood-type breather vent fitting shall be installed.

(b) The vent terminal shall be located above the height of the expected flood waters or snow.

(11) Vent piping from pressure regulators and gas pressure controls shall not be connected to a common manifold that serves a bleed line from a diaphragm-type gas valve.

Statement of Problem and Substantiation for Public Input

Relief valve discharges are likely to release considerably more gas than diaphragm regulators. They cannot safely be discharged to within 3' of an ignition source. This is dangerous and a disservice to the public. It is common practice in the chemical industry to have gas pressure relief valve termination locations modeled to identify safe distances from ignition sources. This document already calls for engineering methods as a means to size pipe. This is likewise the best approach for relief valve vent terminations.

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Public Input No. 59-NFPA 54-2024 [Chapter 6 [Title Only]]

Pipe Sizing Tables

Statement of Problem and Substantiation for Public Input

This chapter 90% supports sizing using the sizing tables and not sizing in general. The title is misleading and hurts the usability of the document.

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Committee: NFG-AAA

Public Input No. 60-NFPA 54-2024 [Section No. 6.1]

MOVE TO CHAPTER 5, 5.3.3, FOR PIPE SIZING METHODS

6.1* Pipe Sizing Methods.

Where the pipe size is to be determined using any of the methods in 6.1.2 through 6.1.4, the diameter of each pipe segment shall be obtained from the pipe sizing tables in Section 6.2, Section 6.3, the sizing tables included in a listed piping system manufacturer's installation instructions, or from the sizing equations in Section 6.4.

6.1.1 US to SI Conversions.

For SI units, the following shall apply: 1 ft^3 = 0.028 m^3, 1 ft = 0.305 m, 1 in. w.c. = 0.249 kPa, 1 psi = 6.894 kPa, 1000 Btu/hr = 0.293 kW.

6.1.2* Longest Length Method.

The pipe size of each section of gas piping shall be determined using the longest length of piping from the point of delivery to the most remote outlet and the load of the section.

6.1.3* Branch Length Method.

Pipe shall be sized as follows:

(1) Pipe size of each section of the longest pipe run from the point of delivery to the most remote outlet shall be determined using the longest run of piping and the load of the section.

(2) The pipe size of each section of branch piping not previously sized shall be determined using the length of piping from the point of delivery to the most remote outlet in each branch and the load of the section.

6.1.4 Hybrid Pressure.

The pipe size for each section of higher pressure gas piping shall be determined using the longest length of piping from the point of delivery to the most remote line pressure regulator. The pipe size from the line pressure regulator to each outlet shall be determined using the length of piping from the regulator to the most remote outlet served by the regulator.

Statement of Problem and Substantiation for Public Input

Chapter 5 is all about pipe sizing methods, its misleading and confusing to speak about pipe sizing in 2 different chapters. Chapter 6 primarily supports sizing using the tables method and not sizing in general.

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Public Input No. 47-NFPA 54-2024 [Section No. 6.2 [Excluding any Sub-Sections]]

Sizing of piping systems shall be in accordance with 6.2.1 or 6.2.2 or an engineering method.

6.2.1 Application of Engineering Methods

Where an engineering method is used to calculate flow of air or gas, or to determine the size of gas pipe or a gas vent, the authority having jurisdiction shall be permitted to require submittal of any or all of the following:

- (1)
  Calculations including documentation that the method used is published and recognized as being valid for the calculations provided
- (2)
  The name of any software used, input and output developed, and documentation that the software is recognized as being valid for the calculations provided
- (3)*
  The name of the person that performed the calculation or design, along with their qualifications to perform the calculation or design

Statement of Problem and Substantiation for Public Input

The term engineering method is provided in chapter 4 as a method for sizing gas piping systems. It belongs here in chapter 6 which is all about pipe sizing. There is no reason for it to be in a general chapter, 4, and not here.

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Public Input No. 61-NFPA 54-2024 [Section No. 7.2.4]

~~7.2.4 Gas Piping to Be Sloped.~~

~~Piping for other than dry gas conditions shall be sloped not less than ¼ in. in 15 ft (7 mm in 4.6 m) to prevent traps.~~

Statement of Problem and Substantiation for Public Input

This requirement is a legacy requirement from when commercially available gas contained condensates. This requirement is misleading. There is no commercial standard that definitively identifies what non-dry gas is and when this should be applied or enforced. It also does not say in what direction the piping is supposed to be sloped.

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Public Input No. 62-NFPA 54-2024 [Section No. 7.2.5]

7.2.5* Prohibited Locations.

Gas piping inside any building shall not be installed in or through a clothes chute, chimney or gas vent, dumbwaiter, elevator shaft, or air duct~~, other than combustion air ducts~~.

Statement of Problem and Substantiation for Public Input

It is not safe to allow for gas piping to be installed within combustion air ducts for the same reasons that all of the other locations are prohibited. Leaks of gas into combustion air ducts could immediately communicate flammable mixtures to ignition sources. This could burn back through the duct and make for a catastrophic explosion and fire.

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Public Input No. 68-NFPA 54-2024 [Section No. 7.4.1]

7.4.1 Pressure Reduction.

The following are requirements for pressure reduction piping installation and regulators installed within chases:

a) Where pressure reduction is required in branch connections for compliance with 5.4.1, such reduction shall take place either inside the chase or immediately adjacent to the outside wall of the chase.

b) Regulator venting and downstream overpressure protection shall comply with 5.7.5 and Section 5.8.

7.4.1.1 Regulator Venting

The regulator shall be accessible for service and repair and vented in accordance with one of the following:

a) Where the fuel gas is lighter than air, regulators equipped with a vent limiting means shall be permitted to be vented into the chase.

~~Regulators~~
b) Where the fuel gas is lighter than air, regulators not equipped with a vent limiting means shall be permitted to be vented either directly to the outdoors or to a point within the top 1 ft (0.3 m) of the chase.

c) Where the fuel gas is heavier than air, the regulator vent shall be vented only directly to the outdoors in a manner that provides for a discharge location at least 12" below the top of the chase.

Statement of Problem and Substantiation for Public Input

The previous language had bundled many requirements into a limited number of paragraphs contrary to manual of style requirements. The heavier than air venting requirement called for a discharge point only directly to the outdoors which could have made for a point simply above the vertical chase allowing for heavier than air discharges to fall back down into the chase. This could make for an accumulation of flammable gases and make for an explosion hazard.

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Public Input No. 69-NFPA 54-2024 [Section No. 7.7.1.2]

7.7.1.2

Outlets shall not be located ~~behind doors~~in concealed areas with limited access for making connections or accessing valves.

Statement of Problem and Substantiation for Public Input

Everything is located behind a door. The intent of this is for installations to not be made in concealed areas with limited access.

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Public Input No. 70-NFPA 54-2024 [Section No. 7.7.1.3]

~~7.7.1.3~~

~~Outlets shall be located far enough from floors, walls, patios, slabs, and ceilings to permit the use of wrenches without straining, bending, or damaging the piping.~~

Statement of Problem and Substantiation for Public Input

7.7.1.3 is not consistent with 7.7.1.4 or 7.7.1.5. It's either enough to prevent straining of the pipe or its 7.7.1.4 or 7.7.1.5, If I leave enough of the connection sticking up, 1" or 2" then it appears that the requirement for "no straining" is met.

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Public Input No. 71-NFPA 54-2024 [Section No. 7.7.2.1]

7.7.2.1

Each outlet, including a valve, shall be closed gastight with a threaded plug or cap immediately after installation ~~and~~ .

7.7.2.2

Each outlet shall be left closed until the appliance or equipment is connected thereto.

7.7.2.3

When an appliance or equipment is disconnected from an outlet and the outlet is not to be used again immediately, it shall be capped or plugged gastight.

Exception No. 1: Laboratory appliances installed in accordance with 9.6.2(1) shall be permitted.

Exception No. 2: The use of a listed quick-disconnect device with integral shutoff or listed gas convenience outlet shall be permitted.

Statement of Problem and Substantiation for Public Input

The existing languages had multiple requirements within the same paragraphs contrary to the manual of style.

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Public Input No. 72-NFPA 54-2024 [Section No. 7.7.2.1]

7.7.2.1

Each outlet ~~, including~~ shall contain a valve ~~, shall be closed~~ and be closed gastight with a threaded plug or cap ~~immediately after installation and shall~~ , including on the valve outlet, immediately after installation.

7.7.2.2

Outlet valves shall be left closed until the appliance or equipment is connected thereto.

7.7.2.3

Outlets are not to be opened for connecting or disconnecting appliances once the system is energized with gas unless the piping is purged out of service in accordance with the provisions of section 8.3.

7.7.2.4

When an appliance or equipment is disconnected ~~from an outlet~~ and the outlet is not to be used again immediately, it shall be capped or plugged gastight.

Exception No. 1: Laboratory appliances installed in accordance with 9.6.2(1) shall be permitted.

Exception No. 2: The use of a listed quick-disconnect device with integral shutoff or listed gas convenience outlet shall be permitted.

Statement of Problem and Substantiation for Public Input

The previous language had multiple shall statements contrary to the manual of style. Also, the previous language did not make it clear that once systems are energized they cannot be opened and gas released unless these systems meet the purging requirements of chapter 8. The current language also does not require valves. The implications are that you can take an energized system apart and let the gas come into the building. This section is clearly aimed at residential installations but has serious hazardous implications for the commercial and industrial gas piping worlds.

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Public Input No. 81-NFPA 54-2024 [Section No. 7.11]

7.11 Systems Containing Flammable Gas–Air Mixtures.

7.11.1

~~Required Components.~~

A central premix system with a flammable mixture in the blower or compressor shall consist of the following components:

(1) Gas-mixing machine in the form of an automatic gas–air proportioning device combined with a downstream blower or compressor

(2) Flammable mixture piping, minimum Schedule 40

(3) Automatic firecheck(s)

(4) Safety blowout(s) or backfire preventers for systems utilizing flammable mixture lines above 2½ in. (64 mm) nominal pipe size or the equivalent

7.11.2 Optional Components.

The following components shall also be permitted to be utilized in any type of central premix system:

(1) Flowmeter(s)

(2) Flame arrester(s)

7.11.3 Additional Requirements.

Gas-mixing machines shall have nonsparking blowers and shall be constructed so that a flashback does not rupture machine casings.

7.11.4* Special Requirements for Mixing Blowers.

A mixing blower system shall be limited to applications with minimum practical lengths of mixture piping, limited to a maximum mixture pressure of 10 in. w.c. (2.5 kPa) and limited to gases containing no more than 10 percent hydrogen. The blower shall be equipped with a gas control valve at its air entrance arranged so that gas is admitted to the airstream, entering the blower in proper proportions for correct combustion by the type of burners employed, the said gas control valve being of either the zero governor or mechanical ratio valve type that controls the gas and air adjustment simultaneously. No valves or other obstructions shall be installed between the blower discharge and the burner or burners.

7.11.5 Installation of Gas-Mixing Machines.

7.11.5.1* Location.

The gas-mixing machine shall be located in a well-ventilated area or in a detached building or cutoff room provided with room construction and explosion vents in accordance with engineering methods. Such rooms or belowgrade installations shall have adequate positive ventilation.

7.11.5.2 Electrical Requirements.

7.11.5.2.1

Where gas-mixing machines are installed in well-ventilated areas, the type of electrical equipment shall be in accordance with *NFPA 70* for unclassified areas unless other hazards require classification of the area.

7.11.5.2.2

Where gas-mixing machines are installed in small detached buildings or cutoff rooms, the small detached building or cutoff room shall be classified Class I, Division 2.

7.11.5.3 Air Intakes.

Air intakes for gas-mixing machines using compressors or blowers shall be taken from outdoors whenever practical.

7.11.5.4* Controls.

~~Controls for gas-mixing machines shall include interlocks and a safety shutoff valve of the manual reset type in the gas supply connection to each machine arranged to automatically shut off the gas supply in the event of high or low gas pressure. Except for open burner installations only, the controls shall be interlocked so that the blower or compressor stops operating following a gas supply failure. Where a system employs pressurized air, means shall be provided to shut off the gas supply in the event of air failure.~~

~~7.11.5.5 Installation in Parallel.~~

~~Centrifugal gas-mixing machines in parallel shall be reviewed by the user and equipment manufacturer before installation, and means or plans for minimizing the effects of downstream pulsation and equipment overload shall be prepared and utilized as needed.~~

~~7.11.6 Use of Automatic Firechecks, Safety Blowouts, or Backfire Preventers.~~

~~Automatic firechecks and safety blowouts or backfire preventers shall be provided in piping systems distributing flammable air–gas mixtures from gas-mixing machines to protect the piping and the machines in the event of flashback, in accordance with the following:~~

~~(1) *Approved automatic firechecks shall be installed upstream as close as practical to the burner inlets following the firecheck manufacturers' instructions.~~

~~(2) A separate manually operated gas valve shall be provided at each automatic firecheck for shutting off the flow of the gas–air mixture through the firecheck after a flashback has occurred. The valve shall be located upstream as close as practical to the inlet of the automatic firecheck. Caution: these valves shall not be reopened after a flashback has occurred until the firecheck has cooled sufficiently to prevent re-ignition of the flammable mixture and has been reset properly.~~

~~(3) A safety blowout or backfiring preventer shall be provided in the mixture line near the outlet of each gas-mixing machine where the size of the piping is larger than 2½ in. (64 mm) NPS, or equivalent, to protect the mixing equipment in the event of an explosion passing through an automatic firecheck. The manufacturers' instructions shall be followed when installing these devices, particularly after a disc has burst. The discharge from the safety blowout or backfire preventer shall be located or shielded so that particles from the ruptured disc cannot be directed toward personnel. Wherever there are interconnected installations of gas-mixing machines with safety blowouts or backfire preventers, provision shall be made to keep the mixture from other machines from reaching any ruptured disc opening. Check valves shall not be used for this purpose.~~

~~(4) Large-capacity premix systems provided with explosion heads (rupture discs) to relieve excessive pressure in pipelines shall be located at and vented to a safe outdoor location. Provisions shall be provided for automatically shutting off the supply of the gas–air mixture in the event of rupture.~~

Systems containing flammable gas-air mixtures shall be designed in accordance with engineering methods.

7.11.2 Equipment used in flammable gas-air mixtures shall be selected in accordance with engineering methods.

Statement of Problem and Substantiation for Public Input

Section 7.11 is proposed to be deleted and replaced with a performance requirement that requires engineering methods. To my knowledge, the committee has no members who routinely design gas piping system containing flammable gas-air mixtures or who have knowledge of such systems. I am advised by staff that no questions on this section have been asked in a long time (possibly decades). Such systems are used, but appear to be of a propriety nature designed using experience and engineering methods. I am also not aware of fires in flammable gas-air mixture systems being a problem

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Public Input No. 18-NFPA 54-2024 [Section No. 8.1.1.11]

8.1.1.11*

Prior to testing, the interior of the pipe shall be ~~cleared~~ purged of all foreign material.

Statement of Problem and Substantiation for Public Input

"Purged" has a more specific and technical connotation in the context of piping systems compared to "cleared." It implies a thorough process to remove contaminants, whereas "cleared" could be interpreted more generally and less rigorously. In the gas piping industry, the term "purged" is standard practice. When gas pipes are fitted, they are typically purged to remove air, moisture, and any potential contaminants to ensure the pipe is safe and ready for use. "Purging" specifies the use of a controlled and deliberate method to ensure the pipe is

free of contaminants, which is essential in maintaining the integrity and safety of the gas piping system.

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Public Input No. 22-NFPA 54-2024 [Section No. 8.1.3.1]

8.1.3.1

Pipe joints ~~, including welds,~~ shall be left exposed for examination during the test.

Exception: Covered or concealed pipe end joints that have been previously tested in accordance with this code.

A.8.1.3.1 Welded pipe joints must be left exposed for examination as well as threaded joints.

Statement of Problem and Substantiation for Public Input

A weld is a pipe joint and including it in the requirement is redundant. Moving to Annex A provides this explanation.

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Public Input No. 49-NFPA 54-2024 [Section No. 8.2.3]

8.2.3* Leak Check.

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the in-service portion of the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made.

Statement of Problem and Substantiation for Public Input

8.2.3 as written does not lead to a leak test of the “Piping System” only the "in service" portion of the system. This creates a non-compliance issue if a portion of the system is isolated within the premises with an open, uncapped, unplugged line or valve with no appliance connected. Additionally, the "Piping System" as defined in 3.3.95.6 cannot be confirmed to have been leak tested, again, only the "in service" portion will have been tested.

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Submittal Date: Thu May 23 14:41:16 EDT 2024

Committee: NFG-AAA

Public Input No. 64-NFPA 54-2024 [Section No. 8.3.1 [Excluding any Sub-Sections]]

The purging of piping systems shall be in accordance with 8.3.1.1 through 8.3.1.4 where the piping system meets either of the following:
The

~~design operating gas pressure is greater than 2 psig (14 kPag).The~~
piping being purged contains one or more sections of pipe or tubing meeting the size and length criteria of Table 8.3.1.

Table 8.3.1 Size and Length of Piping*

Nominal Piping Size (in.)	Length of Piping (ft)
≥2½ <3	> 50
≥3 <4	> 30
≥4 <6	> 15
≥6 <8	> 10
≥8	Any length

For SI units, 1 in. = 25.4 mm; 1 ft = 0.305 m.

* CSST EHD size of 62 is equivalent to 2 in. nominal size pipe or tubing.

Statement of Problem and Substantiation for Public Input

There is no technical basis to allow any piping system of any size that operates at 2 psig to be purged to the indoors of a building. This is totally contrary to the intent of what the US Chemical Safety Board and others have requested of NFPA. Identifying instead the use of tables at least provides some element of protection since it limits the volume of flammable materials released. Defining purging requirements by anything having to do with operating pressures makes no technical sense since purging is defined as the act of removing residuals in the pipe with inert materials. Piping systems of every pressure are depressurized to the

same residual atmospheric state when purging occurs. Operating pressure is has nothing to do with the safety or relative hazard at all.

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Submittal Date: Sun May 26 20:30:40 EDT 2024
Committee: NFG-AAA

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Public Input No. 74-NFPA 54-2024 [Section No. 8.3.1 [Excluding any Sub-Sections]]

The purging of piping systems shall be in accordance with 8.3.1.1 through 8.3.1.4 where the piping system meets either of the following:

(1) The design operating gas pressure is greater than 2 psig (14 kPag).

(2) ~~The piping being purged contains one or more sections of pipe or tubing meeting the size and length criteria of Table 8.3.1.~~

~~Table 8.3.1 Size and Length of Piping*~~

~~Nominal Piping Size (in.)Length of Piping (ft)≥2½ <3> 50≥3 <4> 30≥4 <6> 15≥6 <8> 10≥8Any length~~

~~For SI units, 1 in. = 25.4 mm; 1 ft = 0.305 m.~~

~~* CSST EHD size of 62 is equivalent to 2 in. nominal size pipe or tubing.~~

(2)

Statement of Problem and Substantiation for Public Input

The table provided implies that no worker would be hurt by the amount of gas released that would make for a flash fire in that person's presence. In fact, each size/configuration in the table provided calls for the release of about 3 cubic feet of gas. Since the LEL of natural gas is generally accepted to be about 4.3%, then 3 cubic feet of gas can make about 70 cubic feet of a flammable mixture. This means that the table accepts the worker being in a flammable envelope about 4'X4'X4'. Flash fires lasting only seconds can cause extensive damage. The deminimus TG found no historical scientific basis for the figures given. Hence there is no rational technical justification for this table and it should no longer exist in this document as it makes for a public safety hazard.

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Committee: NFG-AAA

Public Input No. 100-NFPA 54-2024 [Section No. 8.3.1.3]

8.3.1.3 Outdoor Discharge of Purged Gases.

The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location. Purging operations shall comply with all of the following requirements:

(1) The point of discharge shall be controlled with a shutoff valve.

(2) The point of discharge shall be located at least 10 ft (3.0 m) from sources of ignition, at least 10 ft (3.0 m) from building openings and at least 25 ft (7.6 m) from mechanical air intake openings.

(3) During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with 8.3.1.4.

(4) Purging operations introducing fuel gas shall be stopped when 90 percent fuel gas by volume is detected within the pipe.

(5) ~~Persons not involved in the purging operations shall be evacuated from all areas within 10 ft (3.0 m) of the point of discharge.~~

(5)

Statement of Problem and Substantiation for Public Input

There is no technical basis for providing the distance that is given. The document is for natural gas up to 125 psig. Purging methods can include pressure purging. Providing distances like this with no testing to validate them is going to get people hurt and killed. This information is misleading and should not be in this document.

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Public Input No. 101-NFPA 54-2024 [Section No. 8.3.1.3]

8.3.1.3 Outdoor Discharge of Purged Gases.

The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location. Purging operations shall comply with all of the following requirements:

(1) The point of discharge shall be controlled with a shutoff valve.

(2) ~~The point of discharge shall be located at least 10 ft (3.0 m)~~ Engineering methods shall be used to identify safe distances for the point of discharge from sources of ignition, ~~at least 10 ft (3.0 m) from building openings and at least 25 ft (7.6 m) from~~ building openings, mechanical air intake openings, and for determining safe evacuation distances for personnel not involved in the purging operation.

(3) During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with 8.3.1.4.

(4) Purging operations introducing fuel gas shall be stopped when 90 percent fuel gas by volume is detected within the pipe.

(5) ~~Persons not involved in the purging operations shall be evacuated from all areas within 10 ft (3.0 m) of the point of discharge.~~

Statement of Problem and Substantiation for Public Input

There is no technical basis for providing the distances that are given. The document is for natural gas up to 125 psig. Purging methods can include pressure purging. Providing distances like this with no testing to validate them is going to get people hurt and killed. These are misleading and should not be in this document. Engineering methods are described as a process or technique to be used in this document to size gas piping. Likewise, engineering methods can be applied here to identify safe distances.

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Committee: NFG-AAA

Public Input No. 104-NFPA 54-2024 [Section No. 8.3.1.3]

8.3.1.3 Outdoor Discharge of Purged Gases.

The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location. Purging operations shall comply with all of the following requirements:

(1) The point of discharge shall be controlled with a shutoff valve.

(2) The point of discharge shall be located at least 10 ft (3.0 m) from sources of ignition, at least 10 ft (3.0 m) from building openings and at least 25 ft (7.6 m) from mechanical air intake openings.

(3) During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with 8.3.1.4.

(3) Purging

~~operations introducing fuel gas shall be stopped when 90 percent fuel gas by volume is detected within the pipe~~

(3) out of service operations should be concluded when a combustible gas detector indicates no further presence of fuel gas.

(5) Persons not involved in the purging operations shall be evacuated from all areas within 10 ft (3.0 m) of the point of discharge.

Statement of Problem and Substantiation for Public Input

This section discusses purging out of service. The 90% concentration and combustible gas indicator is not relevant for this part of the work. A combustible gas indicator could be used for identifying a target purge point but a combustible gas detector can serve the same purpose.

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Public Input No. 99-NFPA 54-2024 [Section No. 8.3.1.3]

8.3.1.3 Outdoor Discharge of Purged Gases.

The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location. Purging operations shall comply with all of the following requirements:

(1) The point of discharge shall be controlled with a shutoff valve.

(2) ~~The point of discharge shall be located at least 10 ft (3.0 m) from sources of ignition, at least 10 ft (3.0 m) from building openings and at least 25 ft (7.6 m) from mechanical air intake openings.~~

(3) During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with 8.3.1.4.

(4) Purging operations introducing fuel gas shall be stopped when 90 percent fuel gas by volume is detected within the pipe.

(5) Persons not involved in the purging operations shall be evacuated from all areas within 10 ft (3.0 m) of the point of discharge.

Statement of Problem and Substantiation for Public Input

There is no technical basis for providing the distances that are given. The document is for natural gas up to 125 psig. Purging methods can include pressure purging. Providing distances like this with no testing to validate them is going to get people hurt and killed. These are misleading and should not be in this document.

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Public Input No. 103-NFPA 54-2024 [Section No. 8.3.2]

~~8.3.2.1* Purging Procedure.~~

~~The piping system shall be purged in accordance with one or more of the following:~~

(1) ~~The piping shall be purged with fuel gas and shall discharge to the outdoors.~~

(2) ~~The piping shall be purged with fuel gas and shall discharge to the indoors or outdoors through an appliance burner not located in a combustion chamber. Such burner shall be provided with a continuous source of ignition.~~

~~The piping shall be purged with fuel gas and shall discharge to the indoors or outdoors through a burner~~

8.3.2* ~~Piping Systems Allowed to Be Purged Indoors or Outdoors.~~

~~The purging of piping systems shall be in accordance with the provisions of 8.3.2.1 where the piping system meets both of the following:~~

~~(1) The design operating pressure is 2 psig (14 kPag) or less.~~

~~(2) The piping being purged is constructed entirely from pipe or tubing not meeting the size and length criteria of Table 8.3.1.~~

Purging into service

Gas piping systems shall be purged into service with fuel gas using one of the following methods.

8.3.2.1 Discharge of mixed gases during purging into service

The discharge of mixed indeterminate gases during purging into service shall be discharged in one of the following methods.

(3) Residual gas can be consumed through a burner or flare that has a continuous source of ignition ~~and~~ , that is designed for such purpose and has the surrounding environment monitored to verify that carbon monoxide levels do not exceed 50 ppm at locations where personnel can be exposed.

(4) The piping shall be purged with fuel gas that is discharged to the ~~indoors or~~ outdoors, and the point of discharge shall be monitored with a listed combustible gas ~~detector in~~ indicator in accordance with 8.3.2~~1.2. 4~~ Purging shall be stopped when fuel gas is ~~detected~~at a 90% concentration or greater at the equipment isolation valve.

(5) The piping shall be purged by the gas supplier in accordance with written procedures.

8.3.2.2 Combustible Gas Detector.

Combustible gas detectors shall be listed and calibrated or tested in accordance with the manufacturer's instructions. Combustible gas detectors shall be capable of indicating the presence of fuel gas.

Statement of Problem and Substantiation for Public Input

This section is all about purging into service. The use of appliance with continuous ignition can be very dangerous with indeterminate mixtures coming into the system. The use of only devices or burners meant for this purpose provides for a greater level of safety. Also, this is the section where 90% concentration should be discussed. It is also the section where an indicator and not a detector is required.

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Public Input No. 102-NFPA 54-2024 [Section No. 8.3.2 [Excluding any Sub-Sections]]

The purging of piping systems shall be in accordance with the provisions of 8.3.2.1 where the piping system meets ~~both of~~ the following:

(2) The

~~design operating pressure is 2 psig (14 kPag) or less.~~

(2) ~~The~~ piping being purged is constructed entirely from pipe or tubing not meeting the size and length criteria of Table 8.3.1.

Statement of Problem and Substantiation for Public Input

There is no technical basis to allow any piping system of any size that operates at 2 psig to be purged to the indoors of a building. This is totally contrary to the intent of what the US Chemical Safety Board and others have requested of NFPA. Identifying instead the use of tables at least provides some element of protection since it limits the volume of flammable materials released. Defining purging requirements by anything having to do with operating pressures makes no technical sense since purging is defined as the act of removing residuals in the pipe with inert materials. Piping systems of every pressure are depressurized to the same residual atmospheric state when purging occurs. Operating pressure is has nothing to do with the safety or relative hazard at all.

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Committee: NFG-AAA

Public Input No. 106-NFPA 54-2024 [Section No. 9.1.1.3]

9.1.1.3–

~~The unlisted appliance, equipment, or accessory shall be safe and suitable for the proposed service and shall be recommended for the service by the manufacturer~~

Risk Assessment of Unlisted Appliances

Unlisted appliances shall be assessed for risks before they are put into service in accordance with the following:

a) A PHA (process hazard analysis), shall be conducted on unlisted equipment to assess the equipment risks.

c) Documentation of the PHA shall be maintained onsite and made available to the AHJ upon request.

Statement of Problem and Substantiation for Public Input

The previous language was not enforceable and vague. It did not support enforcement or public safety. More than half of NFPA documents call for risk assessments and PHA's. This is not a new concept or term. The intent of the previous text before submission of this PI was to give some method to provide assurance that something unlisted was safe. PHA's provide an objective means to do this using well known process safety processes. The proposed language also puts something objective in the hands of enforcement officials, (AHJ's) that allows them to understand the equipments risks.

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Public Input No. 107-NFPA 54-2024 [Section No. 9.1.4]

~~9.1.4 Safety Shutoff Devices for Unlisted LP-Gas Appliances Used Indoors.~~

~~Unlisted appliances for use with undiluted LP-Gases and installed indoors, except attended laboratory equipment, shall be equipped with safety shutoff devices of the complete shutoff type.~~

Statement of Problem and Substantiation for Public Input

The proposed language is not within the scope of this document. It speaks to the design of the fuel train of equipment. This document addresses only up to equipment isolation valves. Other problems are, what is the dilution rate of the LP gas that is the subject of this, what is a complete shut off safety shut off device? what is a device, did this mean valves? Again, why would we be discussing valves here related to an equipment fuel train. This should be in NFPA 58.

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Public Input No. 108-NFPA 54-2024 [Section No. 9.1.5]

9.1.5 Use of Air or Oxygen Under Pressure.

Where air or oxygen under pressure is ~~used in connection with~~ connected to the gas supply ~~, effective means such as a back pressure regulator and relief valve shall be provided to prevent~~ engineering methods approved by the AHJ shall be implemented to prevent air or oxygen from passing back into the gas piping. ~~Where oxygen is used, installation shall be in accordance with NFPA 51~~

Exception: This does not apply to listed burners providing air under pressure to be mixed with gas.

Statement of Problem and Substantiation for Public Input

The proposed language was not enforceable. It was also not technically sound. Instead of calling for check valves to prevent reverse flow it called for backpressure valves and or relief valves. It also called for NFPA 51 use when oxygen was in use. NFPA 51 is for oxy fuel

systems for cutting and welding and allied processes. What is I was building or connecting a glass melting furnace where oxy fuel burners are typical. Are you telling me here to not use NFPA 86 standard for ovens and furnaces and instead use 51? This makes no sense. This document calls for engineering methods to be used for pipe sizing and other things, there can also be applied here. It also makes sense for special circumstances like this to have the AHJ be involved and informed.

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Committee: NFG-AAA

Public Input No. 109-NFPA 54-2024 [Section No. 9.1.6.1]

9.1.6.1

Where corrosive or flammable process fumes ~~or~~ , gases, ~~such as carbon~~ or aerosol sprays, including but not limited to carbon monoxide, hydrogen sulfide, ammonia, chlorine, and halogenated hydrocarbons, ~~as~~ are present ~~, means for their~~ in combustion air in concentrations that can degrade the safety of the fired equipment, one of the following accommodations shall be made.

a. Means for their removal or safe disposal shall be provided.

b. The fired equipment shall be located or relocated to an area of the facility that is provided with combustion air in accordance with this documents requirements that is not contaminated.

c. The appliance shall be of a design that takes outside air directly from the outdoors, (direct vent).

Statement of Problem and Substantiation for Public Input

Lists are not welcomed in the manual of style. It is proposed that this list be identified as not inclusive of everything that can be a problem. It makes no sense that simply the presence of these is a problem, the concentration has to be such that it is problematic and it has to be in the combustion air. The remedy also has to include cleaning or removing this air.

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Committee: NFG-AAA

Public Input No. 110-NFPA 54-2024 [Section No. 9.1.6.2]

9.1.6.2

~~Where chemicals that generate corrosive or flammable products such as aerosol sprays are routinely used, one of the following shall apply to fired appliances where these chemicals can enter combustion air:~~

~~(1) Fired appliances shall be located in a mechanical room separate or partitioned off from other areas with provisions for combustion and dilution air from outdoors.~~

~~(2) The appliances shall be direct vent and installed in accordance with the appliance manufacturer's installation instructions.~~

Statement of Problem and Substantiation for Public Input

This is redundant with 9.1.6.1 the previous section. PI 109 addresses a means to combine these into one statement that is more clear and comprehensive.

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Public Input No. 111-NFPA 54-2024 [Section No. 9.1.9]

~~9.1.9 Flammable Vapors.~~

~~Appliances shall not be installed in areas where the open use, handling, or dispensing of flammable liquids occurs, unless the design, operation, or installation reduces the potential of ignition of the flammable vapors. Appliances installed in compliance with 9.1.10 through 9.1.12 shall be considered to comply with the intent of this provision.~~

Statement of Problem and Substantiation for Public Input

Addressing flammable liquids and vapors is outside the scope of this document. These are addressed in NFPA 30. This section would prohibit the use of many heat processes used in industry. In automotive paint shops for example, flammable liquids are used in the solvents for paints and then applied next to paint drying ovens. The final sentence clearly implies that this is all about residential issues. This section does not need to be here and does not provide value.

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Public Input No. 112-NFPA 54-2024 [Section No. 9.3.1.1]

9.3.1.1

Air for combustion, ventilation, process, and dilution of flue gases for appliances installed in buildings shall be obtained by application of one of the methods covered in 9.3.2 through 9.3.6. Where the requirements of 9.3.2 are not met, outdoor air shall be introduced in accordance with methods covered in 9.3.3 through 9.3.6.

Exception No. 1: This provision shall not apply to direct vent appliances.

Exception No. 2: Type 1 clothes dryers that are provided with make-up air in accordance with 10.4.4.

Statement of Problem and Substantiation for Public Input

section 9.1.7 defines process air to be a critical consideration and even identifies in the context of combustion air, yet when we talk about combustion air we don't mention it at all. It's vital that process air be also considered when identifying combustion air needs and the document should say that.

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Public Input No. 29-NFPA 54-2024 [Section No. 9.3.2.2]

9.3.2.2* Known Air Infiltration Rate Method.

Where the air infiltration rate of a structure is known, the minimum required volume shall be determined as follows:

(1) ~~For appliances other than fan assisted, calculate~~ Calculate using the following equation:

$$\text{Required Volume}_{other} \geq \frac{21\ \text{ft}^3}{ACH}\left(\frac{I_{other}}{1000\ \text{Btu/hr}}\right)$$ **[9.3.2.2a]**

(2) ~~For fan-assisted appliances, calculate using the following equation:~~

$$\text{Required Volume}_{fan} \geq \frac{15\ \text{ft}^3}{ACH}\left(\frac{I_{fan}}{1000\ \text{Btu/hr}}\right)$$ **~~[9.3.2.2b]~~**

~~all appliances other than fan-assisted input (Btu/hr~~

where:

~~I_{other} =~~

~~(remove the words "other" from the formula)~~

~~I~~

~~fan=fan-assisted appliance input (Btu/hr)~~

~~= Btuh input of the appliances in the space~~

ACH = air change per hour (percent of volume of space exchanged per hour, expressed as a decimal)

~~[9.3.2.2b]~~

(3) For purposes of ~~these calculations~~this calculation, an infiltration rate greater than 0.60 *ACH* shall not be used in ~~Equations 9~~Equation 9.3.2.2a ~~and 9.3.2.2b.~~

Statement of Problem and Substantiation for Public Input

Section 9.3 covers Air for Combustion and Ventilation. The ventilation aspect of the deleted formula was not considered when reducing the volume requirement for fan-assisted appliances. The ventilation aspect is not just cooling of the appliance; it is also for ventilating a space in the event the flue products do not go up the vent. The upper ventilation opening (withing 12" of the ceiling) allows trapped flue products to exit outdoors or to the living space if that's the source of the combustion air. If flue products enter the living space, this code (9.3.2) requires the volume be large enough and the space be leaky enough to dilute the flue products to a less harmful level. This is the rationale behind Sections 10.6 (Decorative Appliances), 10.7 (Gas Fireplaces, Vented), and 10.21 (Room Heaters - vented and unvented) referencing Section 9.3 for Combustion and Ventilation Air. Other Sections in Chapter 10 reference Section 9.3 also. If you have an unvented heater, the space needs to adhere to Section 9.3 volume requirements. Logically, two appliances of the same input should have the same volume requirement for ventilation. There should not be a distinction between draft-hood or fan-assisted appliances. Text from the 2002 handbook (when these formulas were first introduced) states: "The importance of combustion, dilution and ventilation air…cannot be overemphasized. Typical gas-fired natural draft (draft hood) furnaces require approximately 21 ft3 of air (i.e., combustion, vent dilution and ventilation) for every cubic foot of gas burned. Although modern fan-assisted combustion system furnaces do not need dilution air, they still require approximately 15 ft3/hr for each cubic foot of gas burned." It appears that the 21 and 15 numbers came from the fact that fan-assisted appliances do not require dilution air thus the volume requirement was lower. This does not consider the ventilation aspect if the appliance vent malfunctioned, and flue products entered the living space. Additionally, this position seems to be supported with the following text from the same handbook: "The increased use of gas for heating and the popularity of "closet furnaces" following WWII resulted in AGA Research Bulleting #53, "The Effects of Confined Space Installation on Central Gas Space Heating Equipment Performance" published in 1947. The study resulted in a requirement, included in the 1950 edition of the standards...for two air openings into the confined space...and communicating with an area having "adequate infiltration".

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Public Input No. 113-NFPA 54-2024 [Section No. 9.3.7.1]

9.3.7.1 Louvers and Grilles.

Louvers and grilles used to provide combustion air needs shall be designed and installed as follows:

a) The required size of openings for combustion, ventilation, and dilution air shall be based on the net free area of each opening.

b) Where the free area through a design of louver, grille, or screen is known, it shall be used in calculating the size opening required to provide the free area specified.

c) Where the louver and grille design and free area are not known, it shall be assumed that wood louvers have 25 percent free area, and metal louvers and grilles have 75 percent free area.

d) Nonmotorized louvers and grilles shall be fixed in the open position.

Statement of Problem and Substantiation for Public Input

The previous language had multiple shall statements and did not meet the manual of style requirements.

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Public Input No. 114-NFPA 54-2024 [Section No. 9.3.7.3]

9.3.7.3 Motorized Louvers.

Motorized louvers for combustion air shall be designed and installed as follows:

a) Motorized louvers shall be interlocked with the appliance so they are all proven in the full open position prior to main burner ignition and during main burner operation.

b) Means shall be provided to prevent the main burner from igniting should the louver fail to open during burner startup and to shut down the main burner if any of the louvers close during burner operation.

Statement of Problem and Substantiation for Public Input

The previous language did not meet manual of style requirements having multiple shall statements. It also did not call for ALL if the louvers to have to be proven open or if in a failed condition.

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Committee: NFG-AAA

Public Input No. 89-NFPA 54-2024 [Section No. 9.6.8]

9.6.8 Sediment Trap.

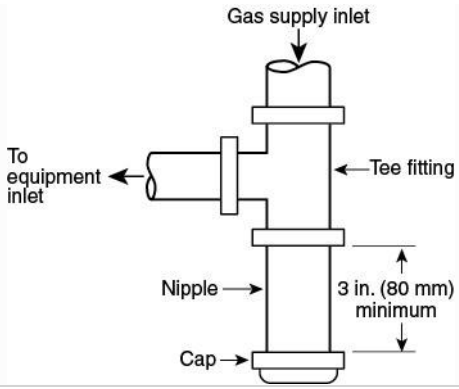
9.6.8.1 Where an appliance is served by piping 2 in. and larger a sediment trap ~~is not incorporated as a part of the appliance, a sediment trap~~ consisting of either a tee fitting with a capped nipple in the bottom outlet, as illustrated in Figure 9.6.8, or another device recognized as an effective sediment trap shall be installed

9.6.8.2 Appliances served by piping smaller than 2 in. shall not be required to have a sediment trap.

9.6.8.3 The sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical at the time of appliance installation.

~~The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet, as illustrated in Figure~~ 9.6.8 ~~, or another device recognized as an effective sediment trap. Illuminating~~ .4 Illuminating appliances, gas ranges, clothes dryers, decorative appliances for installation in vented fireplaces, gas fireplaces, and outdoor cooking appliances shall not be required to ~~be so equipped~~ have a sediment trap.

Figure 9.6.8 Method of Installing a Tee Fitting Sediment Trap.



Statement of Problem and Substantiation for Public Input

Sediment traps have been required in the Code since the 1980 edition, which was the second edition of the National Fuel Gas Code. The first edition of the Gas Code was issued in 1974, combining five standards: 1. NFPA 54-1969 (ANSI Z21.30), Installation of Gas Appliances Gas Piping 2. NFPA 54A-1969 (ANSI Z83.1), Industrial Gas Piping and Equipment 3. ASME B31.2 Fuel Gas Piping This is described in the Origin and Development in the introduction pages of the Code. There has been discussion about sediment traps in previous committee meetings. A proposal was introduced, and after discussion it was not accepter. I have had numerous questions during seminars and from installers asking why sediment traps were needed, stating that they have inspected many sediment traps in their work, but never found anything inside in them. I am advised that sediment traps evolved from drip legs, which are identical. Prior to natural gas replacing manufactured gas drip legs were needed to remove the water that was introduced into manufactured gas during the distribution process. I have also been advised that occasionally liquids are inadvertently added to natural gas due to faulty pipeline

compressors. Sediment traps can serve to remove debris in new piping systems, but beyond an initial period they may no longer provides a useful function. The sediment trap must have a vertical leg of 3 in. or more. It is noted that another gas piping code requires a sediment trap but has no minimum length of the vertical leg, which could be a closely coupled pipe cap. I am not aware of the technical substantiation for this smaller distance. If many sediment traps with just a pipe cap have been installed and allow normal appliance function, it may be that the sediment trap is not needed. I have no engineering substantiation to modify this requirement, but anecdotes reported over the years from plumbers and other piping system installers indicate that many with experience in the field do not believe that they serve a useful purpose. As the experience reported experience relates to residential and commercial piping systems, the requirement for a sediment trap is retained for the larger pipe sizes used in industrial installations.

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Committee: NFG-AAA

Public Input No. 122-NFPA 54-2024 [New Section after 10.18]

10.18.1 Ventilation.

When an outdoor cooking appliance is mounted above a cabinet or other space capable of allowing the accumulation of the fuel gas, ventilation shall be required. A minimum of two (2) vents shall be placed on opposite sides of the cabinet or space and within three (3) inches of the bottom of the space. Each vent shall be at a minimum 4 x 4 inches (or 4.5 inches diameter) or equivalent with a minimum of 16 square inches of unrestricted opening.

Additional Proposed Changes

File Name	Description	Approved
54_PC_2_Held.pdf	54_PC2	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 2 of the (A2023) Second Draft Report for NFPA and per the Regs. At 4.4.8.3.1 and needs to be reconsidered by the TC for the next edition of the document. As a fire investigator, I have investigated far to many built-in gas grill explosions. Manufacturers' instructions are often lacking as to how to provide ventilation when, 1) gas is piped in versus the use of an attached propane cylinder, 2) provide proper ventilation when there is an attached propane cylinder, 3) how to provide any ventilation at all. I have even run across manufacturers' instructions which, when it comes to ventilation for their product, have only said "follow NFPA rules for ventilation"! Clearly, some minimum guidance is needed. While providing a minimum ventilation requirement will not prevent all fire/explosion incidents, it can prevent a good number of them.

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Submittal Date: Thu Jun 06 18:42:12 EDT 2024

Committee: NFG-AAA

Public Input No. 84-NFPA 54-2024 [Section No. 10.24.2]

10.24.2 Support.

~~Suspended~~ Hangers and brackets used to support suspended-type unit ~~heaters shall be safely and adequately supported, with due consideration given to their weight and vibration characteristics. Hangers and brackets shall be~~ heaters shall be of noncombustible material.

Statement of Problem and Substantiation for Public Input

The sentence proposed to be deleted does not contain a specific requirement, and is unenforceable. As an alternate to deletion, it could be revised to read: Suspended-type unit heaters shall be installed in accordance with the manufacturer's installation instructions or engineering methods.

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Submittal Date: Thu May 30 22:29:26 EDT 2024

Committee: NFG-AAA

Public Input No. 82-NFPA 54-2024 [Section No. 12.3.2 [Excluding any Sub-Sections]]

The following appliances shall not be required to be vented:

(1) Listed ranges

(2) Built-in cooking units listed and marked for optional venting

(3) Listed hot plates

(4) Listed Type 1 clothes dryers exhausted in accordance with Section 10.4

(5) A single listed booster-type (automatic instantaneous) water heater, when designed and used solely for the sanitizing rinse requirements of a dishwashing machine, provided that the appliance is installed with the draft hood in place and unaltered, if a draft hood is required, in a commercial kitchen having a mechanical exhaust system [Where installed in this manner, the draft hood outlet shall not be less than 36 in. (910 mm) vertically and 6 in. (150 mm) horizontally from any surface other than the appliance.]

(6) Listed refrigerators

(7) Counter appliances

(8) Room heaters listed for unvented use

(9) Direct gas–fired make-up air heaters

(10) Other appliances listed for unvented use and not provided with flue collars

(11) Specialized appliances of ~~limited input~~ input of 5,000 btu/hr. or less such as laboratory burners or gas lights

Statement of Problem and Substantiation for Public Input

The current requirement is vague. An limit of 5,000 btu/hr. is suggested with no technical basis. It is understood that many gas lights have an input of less than 5,000 btu/hr. A specific limit is needed to make this requirement enforceable.

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Submittal Date: Thu May 30 22:22:51 EDT 2024

Committee: NFG-AAA

Public Input No. 105-NFPA 54-2024 [Sections 12.5.2, 12.5.3, 12.5.4]

Sections 12.5.2, 12.5.3, 12.5.4

12.5.2 Plastic Piping.

Where plastic piping is used to vent an appliance, the appliance shall be listed for use with such venting materials and the appliance manufacturer's installation instructions shall identify the specific plastic piping material. The plastic pipe venting ~~materials~~ shall be ~~labeled in accordance with the product standards specified by the appliance manufacturer or shall be~~ listed and labeled in accordance with UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV*.

12.5.3 ~~Plastic Vent Joints.~~

~~Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions. Plastic pipe venting materials~~

Plastic Venting Test Port.

Where the appliance manufacturer does not provide provisions for combustion gas analysis through a test port, a test tee fitting from the vent manufacturer shall be installed. The test tee fitting shall be listed and labeled in accordance with UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV*~~,~~ and shall be installed ~~in accordance with~~ on the ~~vent manufacturer's installation instructions. Where primer is required, it shall be of a contrasting color.~~ exhaust vent directly above and within 2 ft of the appliance.

12.5.4 Special Gas Vents.

Special gas vents shall be listed and labeled in accordance with UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV,* and installed in accordance with the special gas vent manufacturer's installation instructions.

Statement of Problem and Substantiation for Public Input

IPEX is a manufacturer of thermoplastic systems for the mechanical (including plumbing), electrical and municipal sectors. In the mechanical sector we manufacture DWV products as well as products specifically designed for flue gas venting. Its our belief that a system as critical as flue gas venting should be designed for that purpose and meet industry standards written for the application. This proposal would mandate that the appliance manufacturer specify the vent material type and that only plastic venting listed and labelled to UL 1738 would be permitted for venting the appliance. We are also proposing provisions for a test tee when the appliance does not include these provisions. Generic plastic plumbing products including PVC and ABS are being installed for the most part as mandated by the appliance standards so long as they comply with specific ASTM and CSA standards. The ASTM and CSA standards referenced by the appliance manufacturers are for plumbing applications and do not include provisions for venting of combustion gases. The scope of these standards includes DWV and water applications only and in most cases, there are notes warning that the products defined in the standards do not include provisions for flue gas venting. In one case ASTM D1785 references UL 1738 as the appropriate standard for flue gas venting. This makes sense when you consider that at ASTM the voting members for these standards have no expertise in flue gas venting. The appliance standards contain some testing for venting, but the testing is minimal when compared to UL 1738. Several PVC manufacturers have gone on record for not

supporting the use of their PVC product for FGV applications. Flue Gas Venting (FGV) systems are used to remove lethal combustion gases, namely carbon monoxide, generated by heating appliances from homes and businesses. Because venting systems provide this essential safety feature, they must be built, installed, and maintained to the appropriate standard for this specialized function. Standard UL 1738 consists of stringent requirements for venting systems intended for venting category II, III, and IV gas-burning appliances. Various US States have recognized the safety advantages of UL 1738 listed venting products. These include Idaho, New York, Connecticut, Massachusetts, Rhode Island, Minnesota, and Wisconsin who are all considering or have mandated certain requirements related to UL 1738. The proposal for test tees reinforces the need for safe installation and testing practices. Too many contractors are drilling holes in the exhaust vent and then sealing the hole by inappropriate means such as duct tape. Not only does this practice of drilling a hole in the vent pipe compromise the integrity of the vent system, it also creates an opportunity for CO leakage which jeopardizes public safety. A properly installed test port designed for the application will provide safe access to the flue gases when testing appliance combustion. The US Environmental Agency website states: “Carbon monoxide (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.” Failed venting of gasses from burning fossil fuels can result in raised levels of CO. A recent CPSC hearing to consider mandating carbon monoxide detectors heard presentations on incidents which have injured or killed building occupants. Venting failures were not noted specifically as data for the cause of these failures is not readily gathered or available. Here are links to the hearing which includes testimony from the appliance industry and affected building occupants and family members. CPSC Commission Hearing | Residential Gas Furnaces and Boilers NPR; Oral Presentations (youtube.com) https://www.regulations.gov/document/CPSC-2019-0020-0051 According to the incident data included in the CPSC’s NPR, residential gas furnaces and boilers are associated with a risk of carbon monoxide poisoning. Between 2017-2019, there were annually an estimated 21 CO-related deaths associated with gas furnaces and boilers. From 2000-2019, these products were associated with a total of 539 deaths from CO poisoning. CPSC staff estimates that the aggregate number of nonfatal CO-related injuries from 2014 to 2018 was 30,587, with 22,817 of these treated in an outpatient setting, 7,358 resulting in emergency department treatment, and 412 resulting in hospital admissions. When it comes to the safety of families and workers, it makes sense to use plastic vent materials that meet the UL 1738 safety standard. In Canada, the CSA B149 gas code adopted the ULC S636 standard for non-metallic FGV systems, and IPEX responded with System 636®, an FGV system that meets the performance standards, installation, and safety requirements. Note that ABS and cell core products will not pass ULC S636 or UL 1738 testing. The ULC S636 requirement was prompted by Canadian safety authorities due to identified failures in several existing plastic gas vents—predominately ABS plastic pipe and fittings—such as environmental stress, cracking, and adverse heat effects. This code change has made a positive impact on the safety of flue gas venting in Canadian homes and businesses. Since 2007, inspectors can now confidently verify, in non-metallic systems, that the critical standards of safety and installation have been met. Finally, both UL 1738 and ULC S636 mandate that the pipe, fittings, and cement be from one manufacturer. This is another level of security to ensure proper fitted joints. The ASTM and CSA plumbing DWV standards contain minimum and maximum dimensional tolerances for the OD and ID for pipe and fittings. Products at the ends of each scale from different manufacturers may not provide the required fit for a proper solvent weld joint. Having a system of pipe, fittings, and cements from one manufacturer removes the risk of improper fitted joints and potential carbon monoxide (CO) leakage.

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Committee: NFG-AAA

Public Input No. 16-NFPA 54-2024 [Section No. A.1.1.1.1(A)]

A.1.1.1.1(A)

The final pressure regulator in an undiluted liquefied petroleum gas (LP-Gas) system can include any one of the following:

(1) The second stage regulator or integral two-stage regulator

(2) A 2 psi (14 kPa) service regulator or integral 2 psi (14 kPa) service regulator

(3) A single-stage regulator, where single-stage systems are permitted by NFPA 58.

An equipment isolation valve is intended to be a manual 1/4 turn isolation valve as is required by this document.

Statement of Problem and Substantiation for Public Input

This addition tries to explain what is intended by the term "equipment isolation valve".

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Committee: NFG-AAA

Public Input No. 20-NFPA 54-2024 [Section No. A.9.3.2.2]

A.9.3.2.2

See Table A.9.3.2.2(a) and Table A.9.3.2.2(b).

Table A.9.3.2.2(a) Known Air Infiltration Rate Method: Minimum Space Volume for Appliances Other than Fan-Assisted for Specified Infiltration Rates ***(ACH)***

Appliance Input (Btu/hr)	Space Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
5,000	420	350	300
10,000	840	700	600
15,000	1,260	1,050	900
20,000	1,680	1,400	1,200
25,000	2,100	1,750	1,500
30,000	2,520	2,100	1,800
35,000	2,940	2,450	2,100
40,000	3,360	2,800	2,400
45,000	3,780	3,150	2,700
50,000	4,200	3,500	3,000
55,000	4,620	3,850	3,300
60,000	5,040	4,200	3,600

Appliance Input (Btu/hr)	Space Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
65,000	5,460	4,550	3,900
70,000	5,880	4,900	4,200
75,000	6,300	5,250	4,500
80,000	6,720	5,600	4,800
85,000	7,140	5,950	5,100
90,000	7,560	6,300	5,400
95,000	7,980	6,650	5,700
100,000	8,400	7,000	6,000
105,000	8,820	7,350	6,300
110,000	9,240	7,700	6,600
115,000	9,660	8,050	6,900
120,000	10,080	8,400	7,200
125,000	10,500	8,750	7,500
130,000	10,920	9,100	7,800
135,000	11,340	9,450	8,100
140,000	11,760	9,800	8,400
145,000	12,180	10,150	8,700
150,000	12,600	10,500	9,000
160,000	13,440	11,200	9,600
170,000	14,280	11,900	10,200
180,000	15,120	12,600	10,800
190,000	15,960	13,300	11,400
200,000	16,800	14,000	12,000
210,000	17,640	14,700	12,600
220,000	18,480	15,400	13,200
230,000	19,320	16,100	13,800
240,000	20,160	16,800	14,400
250,000	21,000	17,500	15,000
260,000	21,840	18,200	15,600
270,000	22,680	18,900	16,200
280,000	23,520	19,600	16,800
290,000	24,360	20,300	17,400
300,000	25,200	21,000	18,000

For SI units, 1 ft^3 = 0.028 m^3, 1000 Btu/hr = 0.293 kW.

ACH: Air change per hour.

Table A.9.3.2.2(b) Known Air Infiltration Rate Method: Minimum Space Volume for Fan-Assisted Appliance, for Specified Infiltration Rates ***(ACH)***

Appliance Input (Btu/hr)	Required Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
5,000	300	250	214
10,000	600	500	429
15,000	900	750	643

Appliance Input (Btu/hr)	Required Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
20,000	1,200	1,000	857
25,000	1,500	1,250	1,071
30,000	1,800	1,500	1,286
35,000	2,100	1,750	1,500
40,000	2,400	2,000	1,714
45,000	2,700	2,250	1,929
50,000	3,000	2,500	2,143
55,000	3,300	2,750	2,357
60,000	3,600	3,000	2,571
65,000	3,900	3,250	2,786
70,000	4,200	3,500	3,000
75,000	4,500	3,750	3,214
80,000	4,800	4,000	3,429
85,000	5,100	4,250	3,643
90,000	5,400	4,500	3,857
95,000	5,700	4,750	4,071
100,000	6,000	5,000	4,286
105,000	6,300	5,250	4,500
110,000	6,600	5,500	4,714
115,000	6,900	5,750	4,929
120,000	7,200	6,000	5,143
125,000	7,500	6,250	5,357
130,000	7,800	6,500	5,571
135,000	8,100	6,750	5,786
140,000	8,400	7,000	6,000
145,000	8,700	7,250	6,214
150,000	9,000	7,500	6,429
160,000	9,600	8,000	6,857
170,000	10,200	8,500	7,286
180,000	10,800	9,000	7,714
190,000	11,400	9,500	8,143
200,000	12,000	10,000	8,571
210,000	12,600	10,500	9,000
220,000	13,200	11,000	9,429
230,000	13,800	11,500	9,857
240,000	14,400	12,000	10,286
250,000	15,000	12,500	10,714
260,000	15,600	13,000	11,143
270,000	16,200	13,500	11,571
280,000	16,800	14,000	12,000
290,000	17,400	14,500	12,429
300,000	18,000	15,000	12,857

For SI units, 1 ft^3 = 0.028 m^3, 1000 Btu/hr = 0.293 kW.

ACH: Air change per hour.

Meeting the requirements of the “known air infiltration rate method” is not a guarantee that the equipment will pass the Section 11.6 draft test with current tighter construction, remodeling, and weatherization methods. There are also factors related to building airflows and combustion air that cannot be quantified or predicted, including leakage of supply and return ducts in unconditioned spaces, multiple appliances operating at the same time, operation of exhaust fans, wind and weather conditions, and isolation of appliance areas from sources of combustion air by the closing of doors. This code is not a design manual and should not be considered as such. The formula used to determine the required indoor air volume is meant to provide you with the best guidance available at the time of publication of this edition of NFPA 54. Even tracer gas methods, for determining air infiltration rates, which require specialized equipment, can only determine rates of flow for the time and conditions when the test is conducted.

Air changes per hour (ACH) in this formula is the number of air changes that occur within the building by natural means (ACH_{NAT}). There are several methods to measure ACH, although many factors can affect this value, such as wind velocities, wind direction, barometric pressure, and the number and type of appliances installed and operated within the building.

Tracer gas methods have been developed to determine ACH. Such methods produce the most reliable values for ACH. However, these methods can be expensive and cumbersome, making them out of reach of most contractors or installers. Other published methods for estimating ACHs include ASHRAE estimating methods and those developed by the *Air Conditioning Contractors of America Manual J, Residential Load Calculations*, which includes tightness categories and estimated ACH for each category. The most prevalent technology in use today for evaluating air leakage characteristics associated with structures is through the use of blower door testing. This tool, called ACH_{50}, provides a somewhat consistent and quantifiable means for arriving at the air leakage for a uniform depressurization of a building compared to atmosphere—normally 50 pascals. ~~This method has been successfully correlated to tracer-gas-measured natural air infiltration rates. ASHRAE~~ ASHRAE 62.2 provides a method for converting ACH_{50} to an ACH value ~~that reflects~~ that estimates the actual number of air changes under normal conditions, called ACH_{NAT}.

Many buildings constructed to current building and energy codes can achieve very low ACH_{NAT} values, which need a relatively large indoor volume for naturally drafted appliances. Designers, builders, installers, and inspectors should know that these kinds of values might need indoor air volumes that are greater than structures have available. In such cases, draft testing per Section 11.6 might fail. This could necessitate an alternate means of appliance venting, replacing the appliance, or other remedies for achieving the necessary combustion air other than using indoor air.

The following is intended to provide guidance on developing the ACH factor for use in the “known air infiltration rate” *(see 9.3.2.1)* method of providing combustion air. It supports converting commonly used ACH_{50} blower door air change measurements to estimated natural air infiltration rates.

ASHRAE 62.2, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, provides an infiltration credit formula used with single-point blower door testing for estimating natural infiltration rates. A.9.3.2.2(c) represents one set of simplified ASHRAE method calculations for a single-story building for an ACH_{50} of 3. The formula should be used to calculate ACH_{NAT} for buildings with larger ACH_{50} leakage rates. A design professional should be consulted to validate calculations before they are used as the basis for providing combustion air.

$$Q_{50} = CFM_{50} \text{ blower door reading or } ACH_{50} \times \text{volume}/60 \quad \textbf{[A.9.3.2.3a]}$$

$$ACH_{NAT} = .052 \times Q_{50} \times wsf \times (H / Hr)^{Z} \times 60 / \text{volume}$$ **[A.9.3.2.3b]**

where:

wsf = Weather and shielding factor (from ASHRAE 62.2)

H = Conditioned height above grade

Hr = Reference height, 8.2 ft

Z = .4

Table A.9.3.2.2(c) ACH_{50} to ACH_{NAT} Sample Calculations

$$ACH_{NAT} = .052 \times Q_{50} \times wsf \times (H / Hr)^{Z} \times 60 / \text{volume}$$ *

Single story			
ACH_{50}	**Wsf†**	**ACH_{nat}**	
3	0.30	0.05	
-		0.35	0.06
-		0.40	0.07
-		0.45	0.08
	0.50	0.08	
-		0.55	0.09
-		0.60	0.10
	0.65	0.10	
-		0.70	0.10
	0.75	0.10	
-		0.80	0.10
-		0.85	0.15
	0.90	0.15	
-		0.95	0.15
-		1.00	0.15
-		1.05	0.175
-		1.10	0.20
	1.15	0.20	

*H/Hr was derived from an average of 10 ft. This made for a representative factor for facilities with 8 ft to 12 ft conditioned heights.

†Created with selected weather shielding factors.

Statement of Problem and Substantiation for Public Input

This statement is not universal enough to be included. In some instances, this is the case, but this certainly does not apply to all buildings. The statement would not be true for a building with most of the leakage low and not high in the building. The same building with the same amount and type of holes with the same blower door number would have different natural infiltration rates if the holes were evenly distributed around the building versus most of them being low. Buildings are too different to make such a blanket statement. Determination of actual natural air leakage rates in buildings is not an exact science. Estimate is more accurate.

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Public Input No. 21-NFPA 54-2024 [Section No. A.9.3.2.2]

A.9.3.2.2

See Table A.9.3.2.2(a) and Table A.9.3.2.2(b).

Table A.9.3.2.2(a) Known Air Infiltration Rate Method: Minimum Space Volume for Appliances Other than Fan-Assisted for Specified Infiltration Rates ***(ACH)***

Appliance Input (Btu/hr)	**Space Volume (ft^3)**		
	0.25 *ACH*	**0.30 *ACH***	**0.35 *ACH***
5,000	420	350	300
10,000	840	700	600
15,000	1,260	1,050	900
20,000	1,680	1,400	1,200
25,000	2,100	1,750	1,500
30,000	2,520	2,100	1,800
35,000	2,940	2,450	2,100
40,000	3,360	2,800	2,400
45,000	3,780	3,150	2,700
50,000	4,200	3,500	3,000

Appliance Input (Btu/hr)	Space Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
55,000	4,620	3,850	3,300
60,000	5,040	4,200	3,600
65,000	5,460	4,550	3,900
70,000	5,880	4,900	4,200
75,000	6,300	5,250	4,500
80,000	6,720	5,600	4,800
85,000	7,140	5,950	5,100
90,000	7,560	6,300	5,400
95,000	7,980	6,650	5,700
100,000	8,400	7,000	6,000
105,000	8,820	7,350	6,300
110,000	9,240	7,700	6,600
115,000	9,660	8,050	6,900
120,000	10,080	8,400	7,200
125,000	10,500	8,750	7,500
130,000	10,920	9,100	7,800
135,000	11,340	9,450	8,100
140,000	11,760	9,800	8,400
145,000	12,180	10,150	8,700
150,000	12,600	10,500	9,000
160,000	13,440	11,200	9,600
170,000	14,280	11,900	10,200
180,000	15,120	12,600	10,800
190,000	15,960	13,300	11,400
200,000	16,800	14,000	12,000
210,000	17,640	14,700	12,600
220,000	18,480	15,400	13,200
230,000	19,320	16,100	13,800
240,000	20,160	16,800	14,400
250,000	21,000	17,500	15,000
260,000	21,840	18,200	15,600
270,000	22,680	18,900	16,200
280,000	23,520	19,600	16,800
290,000	24,360	20,300	17,400
300,000	25,200	21,000	18,000

For SI units, 1 ft^3 = 0.028 m^3, 1000 Btu/hr = 0.293 kW.

ACH: Air change per hour.

Table A.9.3.2.2(b) Known Air Infiltration Rate Method: Minimum Space Volume for Fan-Assisted Appliance, for Specified Infiltration Rates ***(ACH)***

Appliance Input (Btu/hr)	Required Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
5,000	300	250	214

Appliance Input (Btu/hr)	Required Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
10,000	600	500	429
15,000	900	750	643
20,000	1,200	1,000	857
25,000	1,500	1,250	1,071
30,000	1,800	1,500	1,286
35,000	2,100	1,750	1,500
40,000	2,400	2,000	1,714
45,000	2,700	2,250	1,929
50,000	3,000	2,500	2,143
55,000	3,300	2,750	2,357
60,000	3,600	3,000	2,571
65,000	3,900	3,250	2,786
70,000	4,200	3,500	3,000
75,000	4,500	3,750	3,214
80,000	4,800	4,000	3,429
85,000	5,100	4,250	3,643
90,000	5,400	4,500	3,857
95,000	5,700	4,750	4,071
100,000	6,000	5,000	4,286
105,000	6,300	5,250	4,500
110,000	6,600	5,500	4,714
115,000	6,900	5,750	4,929
120,000	7,200	6,000	5,143
125,000	7,500	6,250	5,357
130,000	7,800	6,500	5,571
135,000	8,100	6,750	5,786
140,000	8,400	7,000	6,000
145,000	8,700	7,250	6,214
150,000	9,000	7,500	6,429
160,000	9,600	8,000	6,857
170,000	10,200	8,500	7,286
180,000	10,800	9,000	7,714
190,000	11,400	9,500	8,143
200,000	12,000	10,000	8,571
210,000	12,600	10,500	9,000
220,000	13,200	11,000	9,429
230,000	13,800	11,500	9,857
240,000	14,400	12,000	10,286
250,000	15,000	12,500	10,714
260,000	15,600	13,000	11,143
270,000	16,200	13,500	11,571
280,000	16,800	14,000	12,000
290,000	17,400	14,500	12,429
300,000	18,000	15,000	12,857

For SI units, 1 ft^3 = 0.028 m^3, 1000 Btu/hr = 0.293 kW.

ACH: Air change per hour.

Meeting the requirements of the “known air infiltration rate method” is not a guarantee that the equipment will pass the Section 11.6 draft test with current tighter construction, remodeling, and weatherization methods. There are also factors related to building airflows and combustion air that cannot be quantified or predicted, including leakage of supply and return ducts in unconditioned spaces, multiple appliances operating at the same time, operation of exhaust fans, wind and weather conditions, and isolation of appliance areas from sources of combustion air by the closing of doors. This code is not a design manual and should not be considered as such. The formula used to determine the required indoor air volume is meant to provide you with the best guidance available at the time of publication of this edition of NFPA 54. Even tracer gas methods, for determining air infiltration rates, which require specialized equipment, can only determine rates of flow for the time and conditions when the test is conducted.

Air changes per hour (ACH) in this formula is the number of air changes that occur within the building by natural means (ACH_{NAT}). There are several methods to measure ACH, although many factors can affect this value, such as wind velocities, wind direction, barometric pressure, and the number and type of appliances installed and operated within the building.

Tracer gas methods have been developed to determine ACH. Such methods produce the most reliable values for ACH. However, these methods can be expensive and cumbersome, making them out of reach of most contractors or installers. Other published methods for estimating ACHs include ASHRAE estimating methods and those developed by the *Air Conditioning Contractors of America Manual J, Residential Load Calculations*, which includes tightness categories and estimated ACH for each category. The most prevalent technology in use today for evaluating air leakage characteristics associated with structures is through the use of blower door testing. This tool, called ACH_{50}, provides a somewhat consistent and quantifiable means for arriving at the air leakage for a uniform depressurization of a building compared to atmosphere—normally 50 pascals. This method has been successfully correlated to tracer-gas-measured natural air infiltration rates. ASHRAE 62.2 provides a method for converting ACH_{50} to an ACH value that reflects the actual number of air changes under normal conditions, called ACH_{NAT}.

Many buildings constructed to current building and energy codes can achieve very low ACH_{NAT} values, which need a relatively large indoor volume for naturally drafted appliances. Designers, builders, installers, and inspectors should know that these kinds of values might need indoor air volumes that are greater than structures have available. In such cases, draft testing per Section 11.6 might fail. This could necessitate an alternate means of appliance venting, replacing the appliance, or other remedies for achieving the necessary combustion air other than using indoor air.

The following is intended to provide guidance on developing the ACH factor for use in the “known air infiltration rate” *(see 9.3.2.1)* method of providing combustion air. It supports converting commonly used ACH_{50} blower door air change measurements to estimated natural air infiltration rates.

ASHRAE 62.2, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, provides an infiltration credit formula used with single-point blower door testing for estimating natural infiltration rates. A.9.3.2.2(c) represents one set of simplified ASHRAE method calculations for a single-story building for an ACH_{50} of 3. The formula should be used to calculate ACH_{NAT} for buildings with ~~larger ACH~~other ACH_{50} leakage rates. A design professional should be consulted to validate calculations before they are used as the basis for providing combustion air.

$$Q_{50} = CFM_{50} \text{ blower door reading or } ACH_{50} \times \text{volume}/60$$ **[A.9.3.2.3a]**

$$ACH_{NAT} = .052 \times Q_{50} \times wsf \times (H / Hr)^{Z} \times 60 / \text{volume}$$ **[A.9.3.2.3b]**

where:

Q50 = CFM50 blower door reading OR (ACH50 x volume / 60)

wsf = Weather and shielding factor (from ASHRAE 62.2)

H = Conditioned height above grade

Hr = Reference height, 8.2 ft

Z = .4

Table A.9.3.2.2(c) ACH_{50} to ACH_{NAT} Sample Calculations

$$ACH_{NAT} = .052 \times Q_{50} \times wsf \times (H / Hr)^{Z} \times 60 / \text{volume}$$ *

Single story

ACH_{50}	**Wsf†**	**ACH_{nat}**
3	0.30	0.05
-		0.35
-		0.40
-		0.45
	0.50	0.08
-		0.55
-		0.60
	0.65	0.10
-		0.70
	0.75	0.10
-		0.80
-		0.85
	0.90	0.15
-		0.95
-		1.00
-		1.05
-		1.10
	1.15	0.20

*H/Hr was derived from an average of 10 ft. This made for a representative factor for facilities with 8 ft to 12 ft conditioned heights.

†Created with selected weather shielding factors.

Statement of Problem and Substantiation for Public Input

"Larger" is not accurate enough. It is context with the previous sentence regarding the chart based on an ACH50 of 3. But, you can also have ACH50 numbers less than three. The 3 number in the chart was used because that is the IECC ACH50 maximum for new construction. The formula is used for ACH50 numbers both larger and smaller than 3. Move the Q50 formula to A.9.3.2.3b where it belongs. Does not belong before A.9.3.2.3a. It is part of the key for the formula in A.9.3.2.3a.

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Public Input No. 30-NFPA 54-2024 [Section No. A.9.3.2.2]

A.9.3.2.2

~~See Table A.9.3.2.2(a) and Table A.9.3.2.2(b).~~

Table A.9.3.2.2(a) Known Air Infiltration Rate Method: Minimum Space Volume for All Appliances ~~Other than Fan-Assisted~~ for Specified Infiltration Rates ***(ACH)***

Refer to A.9.3.2.3a for buildings tighter than .25

Appliance Input (Btu/hr)	Space Volume (ft^3)		
	0.25 ACH	***0.30 ACH***	***0.35 ACH***
5,000	420	350	300
10,000	840	700	600
15,000	1,260	1,050	900
20,000	1,680	1,400	1,200
25,000	2,100	1,750	1,500
30,000	2,520	2,100	1,800
35,000	2,940	2,450	2,100
40,000	3,360	2,800	2,400
45,000	3,780	3,150	2,700

Appliance Input (Btu/hr)	Space Volume (ft^3)		
	0.25 *ACH*	0.30 *ACH*	0.35 *ACH*
50,000	4,200	3,500	3,000
55,000	4,620	3,850	3,300
60,000	5,040	4,200	3,600
65,000	5,460	4,550	3,900
70,000	5,880	4,900	4,200
75,000	6,300	5,250	4,500
80,000	6,720	5,600	4,800
85,000	7,140	5,950	5,100
90,000	7,560	6,300	5,400
95,000	7,980	6,650	5,700
100,000	8,400	7,000	6,000
105,000	8,820	7,350	6,300
110,000	9,240	7,700	6,600
115,000	9,660	8,050	6,900
120,000	10,080	8,400	7,200
125,000	10,500	8,750	7,500
130,000	10,920	9,100	7,800
135,000	11,340	9,450	8,100
140,000	11,760	9,800	8,400
145,000	12,180	10,150	8,700
150,000	12,600	10,500	9,000
160,000	13,440	11,200	9,600
170,000	14,280	11,900	10,200
180,000	15,120	12,600	10,800
190,000	15,960	13,300	11,400
200,000	16,800	14,000	12,000
210,000	17,640	14,700	12,600
220,000	18,480	15,400	13,200
230,000	19,320	16,100	13,800
240,000	20,160	16,800	14,400
250,000	21,000	17,500	15,000
260,000	21,840	18,200	15,600
270,000	22,680	18,900	16,200
280,000	23,520	19,600	16,800
290,000	24,360	20,300	17,400
300,000	25,200	21,000	18,000

For SI units, 1 ft^3 = 0.028 m^3, 1000 Btu/hr = 0.293 kW.

ACH: Air change per hour.

~~Table A.9.3.2.2(b) Known Air Infiltration Rate Method: Minimum Space Volume for Fan-Assisted Appliance, for Specified Infiltration Rates ***(ACH)***~~

~~Appliance Input~~

(Btu/hr)Required Volume (ft^3)0.25 ***ACH***0.30 ***ACH***0.35 ***ACH***5,00030025021410,00060050042915,00090075064320,0001,2001,00085725,0001,5001,2501,07130,0001,8001,5001,28635,0002,1001,7501,50040,0002,4002,0001,71445,0002,7002,2501,92950,0003,0002,5002,14355,0003,3002,7502,35760,0003,6003,0002,57165,0003,9003,2502,78670,0004,2003,5003,00075,0004,5003,7503,21480,0004,8004,0003,42985,0005,1004,2503,64390,0005,4004,5003,85795,0005,7004,7504,071100,0006,0005,0004,286105,0006,3005,2504,500110,0006,6005,5004,714115,0006,9005,7504,929120,0007,2006,0005,143125,0007,5006,2505,357130,0007,8006,5005,571135,0008,1006,7505,786140,0008,4007,0006,000145,0008,7007,2506,214150,0009,0007,5006,429160,0009,6008,0006,857170,00010,2008,5007,286180,00010,8009,0007,714190,00011,4009,5008,143200,00012,00010,0008,571210,00012,60010,5009,000220,00013,20011,0009,429230,00013,80011,5009,857240,00014,40012,00010,286250,00015,00012,50010,714260,00015,60013,00011,143270,00016,20013,50011,571280,00016,80014,00012,000290,00017,40014,50012,429300,00018,00015,00012,857

For SI units, 1 ft^3 = 0.028 m^3, 1000 Btu/hr = 0.293 kW.

ACH: Air change per hour.

Meeting the requirements of the “known air infiltration rate method” is not a guarantee that the equipment will pass the Section 11.6 draft test with current tighter construction, remodeling, and weatherization methods. There are also factors related to building airflows and combustion air that cannot be quantified or predicted, including leakage of supply and return ducts in unconditioned spaces, multiple appliances operating at the same time, operation of exhaust fans, wind and weather conditions, and isolation of appliance areas from sources of combustion air by the closing of doors. This code is not a design manual and should not be considered as such. The formula used to determine the required indoor air volume is meant to provide you with the best guidance available at the time of publication of this edition of NFPA 54. Even tracer gas methods, for determining air infiltration rates, which require specialized equipment, can only determine rates of flow for the time and conditions when the test is conducted.

Air changes per hour (ACH) in this formula is the number of air changes that occur within the building by natural means (ACH_{NAT}). There are several methods to measure ACH, although many factors can affect this value, such as wind velocities, wind direction, barometric pressure, and the number and type of appliances installed and operated within the building.

Tracer gas methods have been developed to determine ACH. Such methods produce the most reliable values for ACH. However, these methods can be expensive and cumbersome, making them out of reach of most contractors or installers. Other published methods for estimating ACHs include ASHRAE estimating methods and those developed by the *Air Conditioning Contractors of America Manual J, Residential Load Calculations*, which includes tightness categories and estimated ACH for each category. The most prevalent technology in use today for evaluating air leakage characteristics associated with structures is through the use of blower door testing. This tool, called ACH_{50}, provides a somewhat consistent and quantifiable means for arriving at the air leakage for a uniform depressurization of a building compared to atmosphere—normally 50 pascals. This method has been successfully correlated to tracer-gas-measured natural air infiltration rates. ASHRAE 62.2 provides a method for converting ACH_{50} to an ACH value that reflects the actual number of air changes under normal conditions, called ACH_{NAT}.

Many buildings constructed to current building and energy codes can achieve very low ACH_{NAT} values, which need a relatively large indoor volume for naturally drafted appliances. Designers, builders, installers, and inspectors should know that these kinds of values might need indoor air volumes that are greater than structures have available. In such cases, draft testing per Section 11.6 might fail. This could necessitate an alternate means of appliance venting, replacing the appliance, or other remedies for achieving the necessary combustion air other than using indoor air.

~~The following is intended to provide guidance on developing the ACH factor for use in the "known air infiltration rate" *(see 9.3.2.1)* method of providing combustion air. It supports converting commonly used ACH_{50} blower door air change measurements to estimated natural air infiltration rates.~~

~~ASHRAE 62.2, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, provides an infiltration credit formula used with single-point blower door testing for estimating natural infiltration rates. A.9.3.2.2(c) represents one set of simplified ASHRAE method calculations for a single-story building for an ACH_{50} of 3. The formula should be used to calculate ACH_{NAT} for buildings with larger ACH_{50} leakage rates. A design professional should be consulted to validate calculations before they are used as the basis for providing combustion air.~~

$$Q_{50} = CFM_{50} \text{ blower door reading or } ACH_{50} \times \text{volume}/60$$ **~~[A.9.3.2.3a]~~**

$$ACH_{NAT} = .052 \times Q_{50} \times wsf \times (H / Hr)^{Z} \times 60 / \text{volume}$$ **~~[A.9.3.2.3b]~~**

~~where:~~

~~*wsf* = Weather and shielding factor (from ASHRAE 62.2)~~

~~*H* = Conditioned height above grade~~

~~*Hr* = Reference height, 8.2 ft~~

~~*Z* = .4~~

~~Table A.9.3.2.2(c) ACH_{50} to ACH_{NAT} Sample Calculations~~

$$ACH_{NAT} = .052 \times Q_{50} \times wsf \times (H / Hr)^{Z} \times 60 / \text{volume}$$ *****

Single story

ACH_{50}	**Wsf†**	**ACH_{nat}**
3	0.30	0.05
-		0.35 0.06
-		0.40 0.07
-		0.45 0.08
	0.50	0.08
-		0.55 0.09
-		0.60 0.10
	0.65	0.10
-		0.70 0.10
	0.75	0.10
-		0.80 0.10
-		0.85 0.15
	0.90	0.15
-		0.95 0.15
-		1.00 0.15
-		1.05 0.175
-		1.10 0.20
	1.15	0.20

~~*H/Hr was derived from an average of 10 ft. This made for a representative factor for facilities with 8 ft to 12 ft conditioned heights.~~

~~†Created with selected weather shielding factors.~~

Statement of Problem and Substantiation for Public Input

Per the formula deletion in PI 29, A.9.3.2.2b is not needed. Table title for 9.3.2.2a then needed to be revised to accommodate all appliances. A guide was added to A.9.3.2 3a for buildings tighter than .25 which is the lowest ACH in the table.

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Committee: NFG-AAA

Public Input No. 1-NFPA 54-2024 [Section No. G.3.3]

G.3.3 Piping Support.

Inspect piping to determine that it is adequately supported, that there is no undue stress on the piping, and if ~~there are~~ any ~~improperly capped~~ pipe openings have been poorly capped or are not capped at all.

Statement of Problem and Substantiation for Public Input

The prior language is ambiguous, because "improperly capped openings" could imply either of the following: (1) pipe openings that are capped poorly or not at all, (2) pipe openings that are mistakenly capped (and shouldn't be capped at all). An uncapped or poorly capped pipe opening is very dangerous, whereas a pipe opening that is mistakenly capped could always be corrected if doing so was necessary to permit the downstream appliance to operate.

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Public Input No. 88-NFPA 54-2024 [Section No. K.1.2.8]

K.1.2.8 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.
~~www.ul.com~~

UL 651, *Schedule 40 and 80, Type EB and A Rigid PVC Conduit and Fittings*, 2011, revised 2022.

UL 795, *Commercial-Industrial Gas Heating Equipment*, ~~2016, revised 2022~~2024.

Statement of Problem and Substantiation for Public Input

Update references to most current editions.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 87-NFPA 54-2024 [Section No. 2.3.5]	

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